

Psychology

in

the

Classroom

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James Mainwaring

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UNIVERSITY OF LONDON PRESS LTD
WARWICK SQUARE, LONDON, E.C.4

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PREFACE

FACED with a class of schoolchildren the young teacher soon discovers that it is not always easy to apply general principles of psychological theory to the immediate problems of the classroom. This book attempts to provide a classroom psychology and has been written with the practical problems of the teacher constantly in the foreground. It is not based on any one psychological doctrine, but has probably absorbed something from most of the accepted doctrines. It owes most, however, to some thirty years of classroom experience.

It may be useful to mention at the outset that two *a priori* assumptions are accepted by the writer: (1) that a school is essentially a community organized for learning; and (2) that the common practice of grouping children into classes or forms is not only a convenient but a valuable factor in this organization.

There are considerable differences of opinion as to what the aims of a school education should be, but they all necessarily assume that some form of learning is involved and that this can be most effectively achieved in a school. By "learning" we mean, of course, not merely the acquisition of academic knowledge and of skills, but the processes involved in the all-round development of a child, both as an individual and as a member of society. Such development is not the product of undirected natural maturation, as sometimes seems to be assumed. The greater part of this book, therefore, is concerned with processes of learning and with ways by which a teacher can best assist these processes.

The value of class-organization is accepted notwithstanding the emphasis which modern educational theory rightly

places on the importance of individual differences, the necessity of regarding each child as an individual person, and the value of personal freedom, self-expression, and similar ideas. The range of individual differences in a class depends on many factors, such as the size of the class, the method of selection or promotion, the age-range (which is often wide in small rural schools), or the average age of the class, for individual differences tend to widen with the years. In every class, however, there are certain to be some children who are generally or specifically backward, some who are generally bright, some with specific aptitudes. Such differences are dependent not only on differences in innate capacities, general or specific, but may be due to differences in earlier training, in home life or other environmental conditions, in emotional stability, or in health. It follows that backwardness and other deviations from the normal demand from the teacher diagnostic and sympathetic attention.

While modern educational practice has rightly tended increasingly to stress the significance of individual differences and of the teacher's responsibility to the individual members of a class, to infer from this that a class is *merely* a collection of individuals would be false. A class is a social unit, membership of which involves obligations, loyalties, common work and play, and, for many hours of the day, a common life. All of these are valuable elements in a child's social training. Moreover, the normal size of a school-class makes it possible to apply to a given age-group general principles of teaching, and to provide a normal standard by which differences within a class may be assessed. A teacher of a given age-group soon discovers what general standard of capacities and achievement, what typical rates of progress, what usual responses to different situations to expect, and, within this general framework, what deviations from the normal are likely.

This book is concerned mainly, therefore, with the class as a class, because it is concerned with general principles of learning, because teachers in general are responsible for classes of school-children, and because of the value to the child which participation in the organized life of the classroom affords. This approach does not deny the importance of group work or of individual work within the framework of the class organization, or ignore the significance of individual differences within the class, or overlook the many factors which turn the common events of classroom life into the personal experiences of different children.

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PART ONE

KNOWING AT THE MOMENT

CHAPTER I

THROUGH THE SENSES

To do something as apparently simple as to run one's fingers over the surface of a table and say "This is smooth" implies knowledge and skills which have been acquired through many earlier experiences. The experience is a familiar and recognizable one; it is distinguishable from other tactual experiences which might have led to such judgments as "This is rough", or "sticky" or "hot". It is an experience, moreover, which has become associated with the word "smooth". Further, the ability to express the judgment has been acquired, and the expression will be intelligible to those who associate the word "smooth" with similar recallable experiences of their own. Before we turn, later in the book, to the discussion of this kind of cumulative experience, such as is implied in learning, and which influences every new experience, it is necessary to examine the nature of this immediate experience itself, this act of sensory perception through which we become aware of conditions and events outside ourselves at the time. This is necessary, not only because a teacher is constantly concerned with what the class is experiencing at the time, but because all our knowledge or assumed knowledge of the world

outside ourselves is dependent on what we perceive through the medium of sensory experience.

The example quoted is typical of all sensory awareness in that it involves three distinguishable and independent factors. (1) Something outside ourselves, in this example a table, is in contact with some sensitive part of our body. We may neglect any metaphysical doubts as to the independent existence of the table. (2) This contact is causing something to happen in the tips of the fingers which are running over the table's surface. This event we may conveniently call a physical response. (3) The person expressing the judgment is aware of this physical response.

It is very important for the teacher to recognize that the presence of the first two factors does not imply the presence of the third. We may be completely unaware of some perfectly good physical response which some part of our body is making to some external object. The reader, for example, may not have been aware until this moment of the feel of the book in his or her hand, or of the "feel" of the chair.

The necessary presence of these three factors in sensory awareness is obvious enough in the acts of touching, smelling, and tasting; but it is not quite so obvious in the act of hearing. We may hear, for example, the school bell, but the bell is not in immediate contact with any part of our body and may even be in another part of the building. A moment's thought, however, shows that the same three factors are present. The bell may have been remote, but the series of air-waves started by the shaking of the bell had to reach an ear and to set up responsive vibrations in the ear drum, before the possibility of hearing the bell could occur. Again, however efficient may be one's hearing, it is still only a possibility that one heard the bell. In a room in which there is an audibly ticking clock a person may be sitting, completely unaware or only intermittently aware of the

sound, though the person may be well able to hear it and one may presume that the physical response to the stimulus is continuous.

A similar combination of events occurs when anything is seen, except that the light waves are not vibrations in the air. But they have to make contact with our eyes, cause some physical change to take place, and, if we are noticing, we see something. Thus, all our knowledge of the outside world is primarily based on events that have to take place in ourselves. These experiences may be physically painful, as the violent disturbance caused by what we call "loud noise", or by the effect of very bright light. They may also be pleasant, as when we are attracted to something interesting or beautiful.

There are several ways of emphasizing this important truth by illustration. It is impossible, for example, to define colour or a colour, or, say, the sound of a note of a flute. Only through experience are such concepts intelligible. Again, if we walk alongside dark water on which there is an area of reflected light, the light area moves as we move. The part that is coloured or bright to us could be dark to another observer some distance away. His coloured area would be dark to us. There is nothing difficult or mysterious about this, once it is realized that our awareness of conditions and events outside ourselves is based on events which are occurring within ourselves.

The following diagram provides a useful and simple way of illustrating symbolically the three factors which are present in all sensory awareness.

The outer circle represents our physically responsive organs, shown stirred into such responsiveness (PR) by an external stimulus (S). The inner circle represents our available energy, which in the diagram is shown as being concentrated on a single act of awareness.

Not all psychologists would agree with this rather simpli-

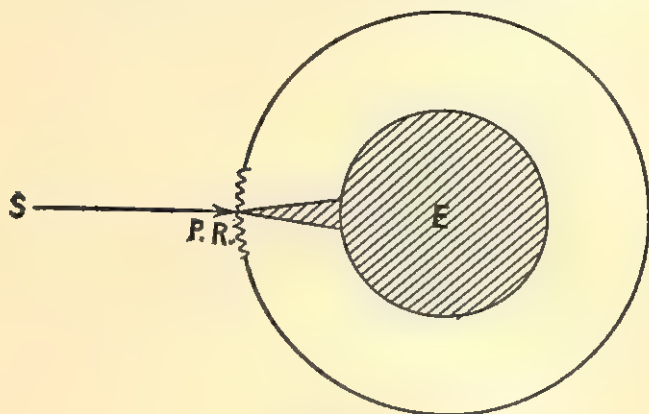


Fig. 1

fied description of sensory experience, but, while covering the essential and commonly observable factors of such experience, it is one which the teacher can apply successfully and usefully in the classroom. The use of the idea of energy in this analysis, for example, is valuable for several reasons. Energy means capacity for work; it is variable in degree, it can be exhausted and replenished. It can be concentrated on a single activity or diffused over a number of activities.

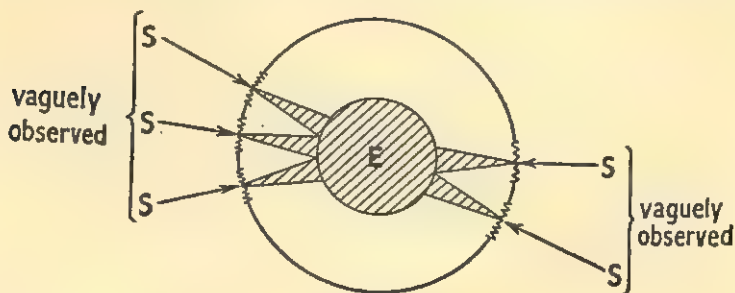


Fig. 2

To continue to look or to listen may involve effort; it may involve the overcoming of considerable resistances, and, in consequence, prove genuinely fatiguing. As we have already observed, the available energy may be so concentrated on a single act of awareness as to leave other possible sensory events unknown; that is, unobserved.

The available energy, however, may be diffused, so that we are at a given moment vaguely aware of several things, and not particularly observing anything (Fig. 2).

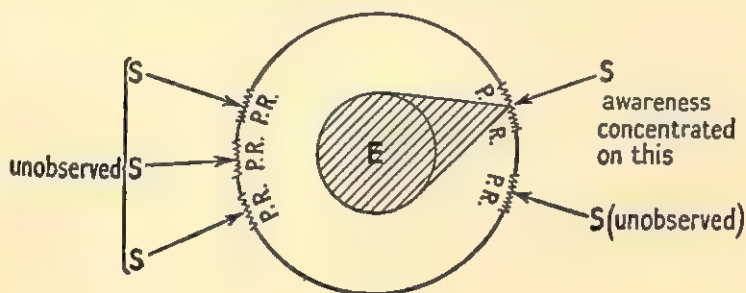


Fig. 3

Sometimes we seem to have too little energy to keep attending to one task, but have plenty of energy to do something else. If it is the second task we wish to do, to continue the first involves the overcoming of resistances, and this absorbs some of our energy or working capacity. When we turn to the second task, which has been distracting us, there are no resistances to overcome, and what energy we have left is available for it. Genuine fatigue differs from boredom in that it implies the exhaustion of energy, whereas boredom implies resistance to continued effort and therefore wastage of energy.

Now let us return to the classroom and imagine that the class is expected to be listening to something. It is more

useful to choose this activity for illustrative purposes than, for example, that of looking at something, because a child can stop doing anything else more noticeably than it can stop listening. If there are no distracting sounds, and no child in the class is deaf, and whatever is to be heard is audible, it is easy to assume that every child will hear it. As we have observed, however, such an assumption is not necessarily accurate. To listen is an activity which involves the application of energy, energy which varies from child to child through physical causes, and which can be wasted if the effort to listen should involve the overcoming of resistances. Moreover, this available energy can be diffused, so that a child may be only vaguely conscious of what is being said, or it may be diverted so that a child, apparently attending, may hear nothing of what is being said (Fig. 4).

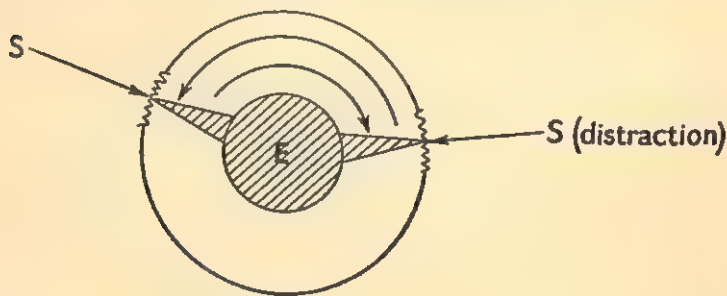


Fig. 4

If the lesson is not to be wasted, the teacher obviously has to see that each child devotes the maximum degree of available energy to it. This, as we have observed, depends not on one but on three groups of factors: (1) the attractive quality of that which is to be observed; (2) the efficiency of the physical conditions which are relevant; and (3) the extent of the child's own responsive interest. The first

and third of these two factors are complementary, and constitute the general problem of how a child's interest can best be stimulated and, having been stimulated, how best it can be maintained. The second group of factors, the physical conditions which control the degree of awareness, need only brief reference. All the teacher can do to make the relevant physical conditions as good as possible for each child is simply a matter of applied commonsense, but it is none the less important. Children with poor hearing or eyesight should sit near the front; underfed children should be encouraged to drink the milk provided; rooms should not be allowed to become stuffy. These and many similar needs may be obvious, but because a principle is obvious it does not follow that it is always and consistently applied.

The first practical problem for the teacher, then, is how to attract the interest of the class.

CHAPTER II

THE ATTRACTION OF INTEREST

THE teacher's problem of the attraction of interest is also the problem of the artist, the painter, the poet, the musician, the problem of aesthetics. A work of art must attract and hold the concentrated interest of the observer as the work of a class must attract and hold the concentrated interest of its members if it is to achieve its purpose. As the problem of teacher and artist is, in this respect, similar, so are the principles on which its solution depends. Stated paradoxically, they are that we are attracted to the new, and that we are attracted to the old. We notice with awakened interest the unexpected, the unusual, the novel; we observe with pleasure the familiar, the recognized. The reconciliation of these two interests lies in the old principle of a varied uniformity. This may be interpreted in two ways: (1) as something new and unexpected in a familiar and normally consistent situation; and (2) as specific modifications of a formal design. In one, the usual series of events may be unexpectedly interrupted; in the other, a patterned design may be interestingly varied, a familiar form imaginatively modified. The most perfect design, if never varied, ceases in time to attract any interest. There must be uniformity, orderliness, design, a planned consistency, but the plan must be adaptable, the uniformity variable, the design imaginatively modifiable, the consistency intelligently elastic.

There are almost unlimited ways of applying this two-fold principle in the classroom, especially if the idea is a conscious factor in the teacher's planning. It can be applied, for

example, to such details as the substitution of a series of short books with differently designed covers for a book long enough to become wearisome. Short books on different topics might be used for group reading. A class may be learning how to apply a colour wash, but some may be painting skies, some seas, others fields. Lessons may be opened in an unusual way, new diagrams may be introduced; quick sketches on the blackboard may be found, if adequate, to attract more interest than do the printed and familiar illustrations. There are, however, more general ways of applying the principle, and the following examples, drawn from different age-groups, are from the writer's own observation.

The Secondary Grammar Schools of twenty years ago, with rigid time-tables, specialist teachers, and the ever-present shadow of the School Certificate and the "Higher", were not the easiest places for experiments in teaching. In one such school the following scheme was a successful attempt by the history master to apply the principle of a varied uniformity to his work. The year's syllabus for each form was divided into six half-terminal assignments, and a copy of each assignment, written on a half-terminal "plan-card", was issued to each boy in the form. Each plan-card had three fortnightly sections, covering six time-tabled "periods". For each of these fortnights there was stated on the card a minimum amount of necessary study from the classbooks, recommended reading from the school and town libraries, relevant map-work, and a topic for a prepared debate. Of the six periods only the first was used by the master for a talking lesson. The second was used for individual study and reading (and by the master for marking some of the previous fortnight's work with the boy concerned at his side). The third was used for a debate, seminars, or for some form of discussion under a class-

elected chairman. The fourth was devoted to relevant map-work, the fifth either to revision by reading, oral questioning, or examination and discussion of relevant illustrations. The sixth period was devoted to the writing of an essay on some topic connected with the fortnight's work. Thus, each fortnight, a section of history had been introduced, studied, presented in relation to its geographical background, discussed, illustrated, and finally tested by an essay. The weaker members of the class had to do a necessary minimum of reading, the more apt members had opportunities for more extensive study.

Lower down the age-groups similar but more elastic schemes than this are practicable. Projects, "centres of interest", social studies, group work, and many other "good ideas" with which every teacher is nowadays familiar, provide such opportunities. In using any such processes the teacher has to make certain that, in avoiding excessive rigidity, he is not introducing such a degree of elasticity that all sense of direction and unity is lost. "In the more informal conditions of group work care must be taken . . . to see that a sense of pattern emerges. The more fluid, varied and stimulating the situation is, the more care needs to be exercised on this point. Everyone finds that his present work gains in significance when it can be set in a meaningful context and be seen as a stage in progressive development."⁽¹⁾ As a rigid uniformity without variety stifles interest, so variety without uniformity, which is unplanned muddle, baffles intelligent interest and finally destroys it.

The question of the extent to which it is possible and desirable to apply the principle to classes of very young children may, perhaps, best be answered by describing three contrasted ways of dealing with percussion-playing in

⁽¹⁾ Quoted from the pamphlet *Group Work as a Growth Factor in the Training College*, by David Jordan.

the top class of an Infants' School. Imagine that a young teacher, filled with the desire to give the children as much freedom as possible, having asked naïvely if the class would like to play the percussion instruments, tolerates a wild rush to the cupboard. Asking, when her voice could be heard, who would like to play the drums, she endures a hubbub of arguments as to who should play this or that, made noisier by those who, having already seized an instrument, had begun to bang it. If and when the playing stage is reached, nothing is played accurately and everything is played noisily. Such an experience, which is not altogether imaginary, is rapidly boring to the children and is musically harmful.

Consider, at the other extreme, the old teacher who has never had any sympathy with such nonsense and who believes in law and order. At the command "Stand! March to percussion places!" the children move in submissive silence to their appointed places. The instruments are fetched and distributed by previously appointed "monitors" to previously appointed groups, and the class proceeds to play its drilled exercises from the charts, afraid to make a mistake, afraid almost to hit their tambourines. There is no joy in this experience.

In an Infants' School which the writer has often enjoyed visiting, a percussion period is an experience which is both musical and a joy to children, teachers, and visiting students. The children begin by rearranging their chairs, knowing exactly where to put them. They know too whose turn it is to distribute the instruments. Items from an astonishingly extensive repertoire are of two kinds, those played just for fun, which they read and then pass on to another, and those which they learn to play properly, "like a band". Some pieces they sing and then make up their own percussion, saying which part they think might sound best with only triangles, and so on. There is thus considerable variety,

but there is orderly unity, and the group feels that it is a little band. That they enjoy the experience is obvious; that they have learned much is equally clear from the way in which they tackle a new score "for fun".

Applicable, then, to children of all ages, and to ourselves, this general principle is of very great importance in the classroom, where a teacher can so easily fall into wearisome routine or, at the other extreme, introduce such a degree of freedom and novelty that all that sense of security which is characteristic of the orderly and the familiar is lost.

In practice it is not usually difficult to attract the interest of a class. The more difficult problem is how to maintain such interest, and to this we now have to turn more specifically.

CHAPTER III

THE MAINTENANCE OF INTEREST

WHAT we have discussed so far has been mainly concerned with the problem of obtaining from a class the greatest possible degree of awareness at a given time, the problem of immediate interest. We have seen that attention implies the concentration of the available energy and that, if prolonged attention involves the overcoming of resistances, there is a wastage of energy and much of the lesson may be lost. Interest, therefore, has not only to be stimulated but maintained. In order to make clear some of the factors involved in keeping interest alive it is helpful to examine in greater detail the nature of a child's experience when it is observing something with interest.

Suppose the accompanying diagram to have been shown to an intelligent class of secondary-modern-school age, and that the children have been asked to write a comment, no further instruction having been given. Consider the five following possible comments.

- (1) It is beautiful (nice to look at, pretty, a nice design).
- (2) It is a star.
- (3) It is a star with six points; it would look the same any way up.

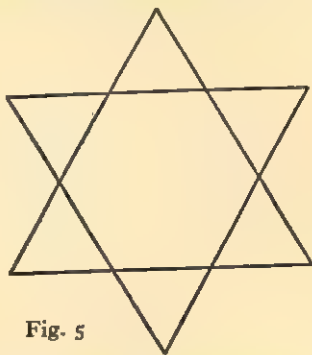


Fig. 5

(4) It is a six-pointed star, made by drawing an equilateral triangle on each of the sides of a regular hexagon. It could have been made by putting an equilateral triangle upside down on another one of the same size.

(5) I could make a star like this with eighteen matches. You could keep on adding to it to make a big pattern. It would go on for ever.

These five possible answers represent five different kinds of interest. The first is an aesthetic interest; it is restricted to the pleasant experience of simple perception, as that of an infant attracted to a bright colour. The second, like the first, reveals the perception of the figure as a "whole", but proceeds no further. The third has gone a little further; it represents a descriptive kind of interest, an attempt to observe some of the attributes of the figure. The fourth is an analytical interest, revealing the observation of relationships. The last represents an imaginative interest, which goes beyond the perceptual experience. Let us now consider the significance of these in turn.

The characteristic of the aesthetic interest is that it does not involve any mental activity, except of course for the experienced contemplator in a particular artistic field. In very simple experiences of this kind it is easier to isolate the nature of the interest; if one says: "I like the sound of a flute", or "That is a lovely colour", all one can do is to listen or to look, and find the experience pleasing. Because there is no necessary mental activity involved interest soon flags; one cannot keep on looking at a colour, or a star, or an attractive view for very long. Interest in a musical experience may last as long as the musical item, but when irrelevant factors are excluded the maintenance of interest is just as difficult in this as it is in visual experience. In broadcast or recorded non-rhythmic orchestral music, three such factors are excluded; there are no players to watch, no words to

think about, and no inducements to excite rhythmic responsive movements. It would be absurd to expect a person with no musical knowledge to feel and much less to maintain any concentrated interest in listening to such music.

In genuine aesthetic experience there is probably a greater concentration of interest than in any other form of experience, while it lasts. But when it is merely contemplative, when it is unaccompanied by any other mental activity, it is quickly exhausted.

The second response to the figure resembled the first in that the figure was seen as a "whole", and it was necessary to include this response only because of the educational significance of this kind of perception. The psychological doctrine known as "Gestalt Theory" ("Gestalt" is the German for "form" or "shape") expresses the view that what we see or hear is seen or heard as a "whole", and that this whole is something quite distinct from a mere aggregate of the items that constitute it. For example, we see and recognize a face as a face, not as a collection of eyes, nose, ears, mouth, and so on. How little we have observed of the detailed structure of things with which we are very familiar is rapidly revealed if we try to draw them "from memory"; unless, of course, we are trained artists. The same tendency is true of auditory experience. We hear a tune as a tune, and though we may be able to recall it readily and even sing or play it, we may know little or nothing about its constituent elements. Most people, for example, may be assumed to be sufficiently familiar with the British National Anthem to sing it, if they can sing anything, but this capacity does not involve any knowledge of the tune's structure. To answer such a question as how many notes at the end "go down" most people would have to sing the tune, or "sing it to themselves", to discover the answer. Some of the important implications of this doctrine are discussed

later; the point of immediate importance is that, while most perception begins in this way and may remain at this stage, it must proceed further if interest is to be maintained. Some mental activity must be stimulated, and through such activity the experience is enriched.

The three remaining types of response evoked by the figure represent three ways in which the initial interest may be maintained and extended. Each way involves mental activity, but of different kinds. The first is the simplest, as it is merely descriptive. It involves a deliberate search for attributes, and would be stimulated by some such question as "What do you notice about this?" It is valuable because it is a mental activity which carries the vague awareness of a whole a stage further. Knowledge becomes clearer and more articulate. The writing of clear and accurate descriptions helps to concentrate the process.

The fourth response, which illustrates the second kind of mental activity stimulated by the figure, represents a far more valuable and enduring kind of interest, that of observing the relations between the items perceived. The process can, of course, take place at a much simpler level than that of the geometrical analysis. If two things are observed it may also be observed that one is bigger, higher, or more coloured than the other, or that it is part of the other, or opposite to it. It may be observed that one event is the reason for another, or the cause of another, or its consequence, and both events gain a new significance.

We have observed that this process of educing relations between items which are perceived is not the way in which perception usually works; at least it is not the way in which perception usually begins. The whole interrelationship is observed as a whole, and awareness may proceed no further. Two classroom principles may be deduced from this: (1) when possible, teaching should proceed from general perception

to analytical knowledge; (2) the class needs help and guidance in this process of analysis, and it is such guidance which leads to the restimulation of interest and consequent enrichment of the experience.

Consider the following simple example of a lesson which illustrates the four stages which constitute the ideal sequence of events in the learning process. The class is intended to learn the meaning of "scalene triangle". On the blackboard several triangles are shown, some equilateral, some isosceles, and one scalene. The class is asked to discover which triangle is different from the others. The process is repeated in a variety of ways until the scalene triangle is generally recognized. It is then named. The class is then asked to draw a scalene triangle, which involves their having observed or their now having to observe what makes it a different kind of triangle from any other. They now have to know, not merely to recognize. The last stage is to make this knowledge exact and articulate by asking what it is that distinguishes this triangle from others; the class has reached the stage of making its own definition of a scalene triangle. The four stages in this process were (1) perception, (2) recognition and naming, (3) reproduction, and (4) definition.

Most people's general knowledge does not proceed beyond the second of these stages; it does not become sufficiently precise and articulate to reach precise definition. The reader may test this for himself by asking someone not trained in the exact formulation of his ideas to define some common object, such as a chair. A probable answer is that it is an article of furniture on which to sit. If it is pointed out that this includes stools, the victim may add "Oh, with a back, of course!" It may then be pointed out that this definition includes settees.

It is impossible to lay too much stress on the principle

that teaching should proceed towards that clarity of knowledge which definition expresses, rather than that it should begin with definition and hope to produce in the child a mental synthesis. Words without a content of experience have as little value as labels on empty bottles. Imagine what the word "orange" means to us who have tasted, peeled, squeezed, smelt, held, dropped, and eaten oranges, and how helpless are words to replace these experiences. Yet excessive reliance on descriptions and definitions, when such reliance is unnecessary, is still common in many classrooms. For example, it is still a common practice to introduce "dotted notes" in elementary music by saying that the dot makes the note half as long again. Quite apart from the occasions when this is merely confusing nonsense (as when a dotted minim is used in 6/8 time), no one ever thinks of a dotted note in that way, even in triple time. Who, for that matter, normally thinks of three as being half as much again as two?

While this argument implies the advocacy of much greater and more varied "activity" in the classroom than many teachers would consider necessary or desirable, it does not justify those "activity methods" which are not an essential part of some planned, purposive, and consciously directed unity. The argument simply asks for the substitution of a more rational progression in the learning process than that which depends on verbal instruction without empirical content. It transfers definition from the beginning to the end of the process.

The significance of the fifth response to the figure is that this kind of interest includes all the others and goes beyond them. It includes the aesthetic interest, for there is no greater joy of concentration in any mental process than in that of imaginative creativeness. It sees the figure as a whole and foresees the possibility of its unlimited extension.

It sees too how this can be done. The process is a two-fold one; a relationship is observed, and new items are brought into this relationship. Consider, as an example, the Intelligence Test which is based on analogies. In such a question as "Clay is to Brick as Flour is to Corn? Bread? Wheat? Field?" the relation between clay and brick has to be educed before the word is selected as being in similar relation to flour. Tests which ask for the continuation of a series of numbers involve the same double process, and exclude solutions based on verbal associations. In such an example as "Add three more numbers to continue the series: 2, 5, 8, 11, 14, . . .", it has first to be observed that the series rises by threes before the required numbers can be found and brought into the same relationship.

In the above examples and in many similar processes, in form-boards and jig-saw puzzles, the process is restricted to one correct solution; but in its most attractive form it is not so restricted. New and imaginative items may be brought into a known relationship as, in the fifth response, the child saw the imaginative possibility of indefinitely extending the figure. In this imaginative process lies the joy of creative art, of scientific invention, of inductive reasoning, or of philosophic speculation. It finds its place in the classroom because children, especially young children, have not yet lost what Robert Bridges called "joy in the making". From the infant's miming or the embroidering and model-construction of the Junior School child to the poem or imaginative essay of the sixth-former, there is, or can be, "joy in the making".

At first sight to recommend the extension of this kind of interested mental activity might appear to contradict the principles advocated in the previous section of this chapter. This process is integrative, synthetic: the other is a progressively analytical extension of knowledge. The two processes

are, however, complementary, not contradictory, and both are integrating processes, for to see things in relationship is to bring perceived items into an ever-extending unity. Whether this last process consists of adventurous experiment, or intelligent construction, or purposive composition, it implies awareness of the existing relationships; it is not a piecemeal fiddling with disconnected oddments in the optimistic expectation that something worthwhile will result.

Interest, then, can be maintained only by the constant restimulation of relevant mental activity, directed towards the progressive enrichment and clarification of experience. In the natural and most profitable sequence of events this progression needs to be guided from an initial vague perception to articulate conceptual knowledge, and, when practicable, to the imaginative, experimental, and constructive application of this knowledge.

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PART TWO

LEARNING



CHAPTER IV

KNOWING HOW WITHOUT REMEMBERING HOW

IN the previous section we were concerned mainly with knowing at the moment, or, more accurately, with the nature and extent of immediate awareness through sensory experience. Learning, however, implies the growth of knowledge; it implies that experiences, having occurred, are not necessarily lost, but are themselves influenced by former experiences and contribute in some cumulative fashion to subsequent ones. It is easy to ascribe this capacity to "the memory", easy but quite meaningless, for to say that people have memories is simply another way of saying that people can remember. As we shall see in this section of the book, there are many ways of remembering and of learning, and these ways are independent. To be "good" at one way does not imply efficiency in other ways. If the different processes of remembering were *interdependent*, so that "goodness" in one did imply "goodness" in all the others, then it would be sensible to regard these different processes as functions of some common capacity which we could call "the memory".

That the different ways of remembering are independent

and not interdependent processes may easily be demonstrated. A child who finds it difficult to remember a verbal instruction may recall readily a picture, diagram, or other visual aid; he may remember an arithmetical table but not how to apply it; he may rapidly forget the greater part of a diligently studied text, yet remember in astonishing detail how to assemble an intricate model. Evidence of this kind is provided by any class of children. Stories of the forgetfulness of the most learned professors are not wholly imaginary, but they obviously cannot imply that "absent-minded professors have bad memories". In order to examine some of the more important factors in progressive learning it is necessary, therefore, that different processes of remembering should be examined separately.

So far in this chapter we have used the word "remembering" to mean any process by which an experience is in some way and in some degree retained by the experiencer, so that it is available in some measure in the progressive process of learning. In normal usage the word is restricted to those processes in which an experience is consciously recalled, and it is in this sense that we shall now use it. There are, however, certain processes of learning in which remembering, as a conscious process of recall, seems to play little or no part. It is helpful to examine these processes first.

Let us consider a number of elementary skills which children of infant-school age have already acquired or have begun to acquire, as, for example, the fastening of a button or the tying of a shoe-lace. To do either is quite a complex process, and how little we know about the complicated movements which the fingers carry out so efficiently may be rapidly demonstrated by an attempt to describe in precise detail these movements without actually doing them. It is virtually impossible to do so. The fingers have learned the skill by doing the actions until they have become automatic.

This form of mechanized learning plays a far greater part in general human efficiency than is commonly supposed. We are not aware of what our tongue is doing in speech; we do not consciously have to balance ourselves when standing or direct the movements of our legs when walking. Instrumental virtuosity would be unattainable if the movements of the fingers had to be consciously and separately directed. The graceful ease of the perfect cricket stroke implies a co-ordination of responsive actions that have to be immediate.

It is necessary to distinguish such skills, habits, and other forms of mechanized actions, which have been acquired, from instinctive actions, which are unlearned spontaneous actions; as, for example, a protective shutting of the eyes. A motorist who, in an emergency, has no time to think but does all the correct things spontaneously, has not performed *instinctive* actions but *skilled* actions which he has had to learn to perform.

The value of the process of learning by the mechanization of actions is obvious. Speech would be so laborious as to be almost impossible if we had to think not only what to say but what to do with lips, tongue, and other items of the vocal apparatus in order to utter the thought. Once a skill has been acquired, mental activity is released for the use of the skill, as in speech one can attend to what one wishes to say. Conversely, the very efficiency of the process may be harmful. With increasing dependence on mechanized activities mental capacities tend to atrophy, people cease to think, and leisure, with no directed activity, becomes boredom. The acceptance of principles of moral behaviour avoids the responsibility of having to decide for oneself. Habits are acquired with equal facility whether they are desirable or undesirable.

It is this quality of habit formation that makes the process so important in the classroom. There it has to be directed

intelligently, so that desirable skills and habits are efficiently developed, and undesirable habits and actions checked before they have become ineradicable.

The process depends on two general psychological principles: (1) an action, by occurring, tends to recur more readily than it occurred; (2) a series of actions tends to recur as a series, each action acting as the stimulus of the next. We shall discuss these separately.

The first principle states simply that what we do we tend to do again, and it implies that each time we do it the tendency to do it again is increased. This is true whether the first action is deliberate or an unconscious one. The process begins in earliest infancy and continues through life. One important application of the principle to life at home or in school is that some desirable action, consistently pursued, tends to be accepted and performed without question. A child who has no regular bedtime, but who is allowed to stay up on all sorts of pretexts, will tend to become argumentative and resentful whenever it is told to go to bed. A child who is treated with greater consistency will tend to accept the usual procedure as a matter of course, to its own and everyone's greater comfort. As we have previously observed, a reasonable consistency in the classroom, productive of a smooth-running orderliness, produces also that calm sense of security which gives far greater pleasure to children and teacher than can any prolonged confusion.

As the principle applies indiscriminately to any kind of action, it follows that errors should be avoided as far as possible and, when they occur, should be corrected by the child. Some years ago a young boy in a boarding school concluded his weekly letter home with the phrase "lotes and lotes of love". His father asked the housemaster to improve the boy's spelling, and "lots" had to be written five hundred times. The first hundred or so were correctly

spelt, but nearly four hundred "lotes" completed the exercise. When years had changed the boy, but not the habit, a letter from the Royal Air Force ended "lotes (sorry!) lots of love".

The second principle, that actions which occur as a series tend to recur as a series in which each separate action acts as the stimulus of the next, is probably the most generally useful and most easily abused of all the processes of learning. We have seen that such a mechanized series of actions occurs in everyday skills, as in the fastening of a button, in walking or running, or in tying a shoe-lace; but the acquisition of all skills at least includes the process.

A very clear example of good and bad ways of learning by this process may be drawn from the world of music. A young pianist, confronted with a difficult passage, usually stumbles through it with whatever fingers happen to fall on the notes, or on nearby notes, and, as these inaccuracies and clumsy fingering tend to recur with subsequent performances, the passage rarely, if ever, reaches the stage of being played with fluent and easy accuracy. If, however, the passage is played slowly enough to ensure that the correct fingering is used and that every note is accurate, surprisingly few repetitions of this kind are required before the actions of the fingers becomes automatic and the speed can be increased without loss of accuracy. The efficacy of this procedure can be demonstrated over and over again, but it is rare to find a student who would consistently apply it instead of indulging in a more adventurous scramble.

The factors implicit in the above illustration apply similarly to skills of all kinds, to writing, spelling, arithmetical processes, manipulative crafts, games, keeping oneself clean, classroom procedure, and, in fact, to everything that involves action. The general classroom implications are obvious in theory, but, unfortunately, they present a difficult

practical problem, indicated in the preceding paragraph by the general unwillingness of children to abandon the more interesting experience of "having a try" for the less adventurous but ultimately more profitable procedure of ensuring initial accuracy. In those areas of school life where skilled efficiency is of less importance than the immediate joy of uninhibited activity, as in school games, or in all the arts, music, painting, drawing, modelling, mime and drama, at least some occasions should be included when the experience is thought of as an enjoyable whole, and interruptions for specific errors are reduced to the least possible. In an earlier example quoted the reader will recall that in the percussion work there described some was played "for fun", some was learned "properly, so that it could be played as a band would play it".

In other areas of school work, in which the greatest degree of accuracy or efficiency is necessary, there should be no such compromise, but errors should from the first be avoided as far as possible and, when they occur, corrected before they become habitual. Toleration of slipshod and careless work is merely a demonstration of slipshod and careless teaching. Even in those areas where some indulgence is permissible it is indulgence of carefree joy, not of careless and half-hearted effort, and in these the increased joy and satisfaction of doing something well can soon be discovered. If the teacher remembers that whatever happens is likely to happen again, and that the more often it happens, whether it is desirable or undesirable, the more certain it is that it will continue to happen, it should not be difficult to decide, in any specific instance, whether to encourage its continuance, tolerate it for some reason, or to endeavour to prevent it from happening or from happening again.

CHAPTER V

LEARNING BY ROTE

LEARNING by rote is the process of memorizing by verbal repetition. Though the process is described as "memorizing" and is usually regarded as a form of remembering, it more nearly resembles the process of habit formation or the mechanization of skills, as described in the preceding chapter. Learning by rote consists similarly in the mechanization of a series of physical acts by its repeated performance. It may be necessary to give a child the opening words of a memorized passage or to strengthen weak links by giving the opening words of stanzas or sections separately memorized; but once the series has been started it continues without conscious direction and, at times, even in opposition to the will. The irritating habit which some people have of humming a tune over and over again while concentrating on some task is an example of this, as is the equally objectionable experience of "having a tune on the brain", for the process of learning a tune by repeating it is essentially similar to that of repeating a verbal passage.

Skill formation and learning by rote have another common characteristic. Experiments carried out by the British Institute of Industrial Psychology have shown that many skills, as for example that of typing, are acquired more efficiently and quickly if the series of actions involved is a rhythmic one. In the same way it is easier for a child to learn to recite a passage of rhythmic verse than a piece of non-rhythmic prose, and the class recital of multiplication tables tends to fall into a rhythmic pattern.

As the two processes are, therefore, essentially similar, it follows that both processes will be influenced by the same factors: the accuracy of first performance, the frequency of accurate repetition, the regularity of the repetitions, and the avoidance of unnecessary fatigue and boredom. In general the principle of "little and often" best achieves these ends.

For many years the process has been an immensely popular classroom technique. It has many invaluable uses; it provides an easy occupation for the whole class; jingles, poems, passages of prose, parts of a play, songs, mathematical tables, formulæ, lists of rivers, capes, prime ministers, dates, vocabularies, or anything that can be repeated verbally or vocally, fall within the scope of the process; the acquired "knowledge" is something "definite", which can be neatly tested and statistically assessed. The process has so many advantages of this kind that the most useful relevant service a psychologist can render a teacher is to indicate the limitations of the process. As habits can be formed with equal facility whether they are desirable or undesirable, so rote-memorization proceeds with equal efficiency whether that which is memorized is worthy or worthless, valuable or useless. A brief discussion of four types of schoolwork to which the process is most frequently applied should be sufficient to indicate its most valuable and less worthwhile uses. The four categories selected are (1) verse, prose, and song; (2) mathematical tables; (3) definitions; and (4) lists of what are usually called "facts".

In the first of these four categories we have included songs because their memorization depends on the same factors as does that of verse. Before a child can read it is obviously most desirable that it should learn to recite and to sing simple verse and suitable songs, preferably short ones. One normally assumes that the child is, at the same time, learning to speak, read, and write the language, but until

recently, and still in a minority of schools, one could not justifiably make a similar assumption about the child's musical experience. To insist that a child should not learn songs by imitative repetition, as some teachers do, is to rob the child unnecessarily of much of the joy of singing; but to restrict the child's musical experience to memorized songs, unfortunately still a frequent practice, is as stupid as it would be to restrict the child's linguistic experience to memorized recitations. Once a child can read a language or music, the memorization of specific items becomes increasingly restricted to a training in performance, in interpretation, in elocution or musical virtuosity. Good class-singing, choral speech, and similar applications of the process are or can be amongst the most enjoyable and worthwhile class activities; but to neglect the more important skills of reading and writing in order to memorize items or to perfect performance is unjustifiable.

There may be teachers who would accept the above statements in their application to language but not to music. Perhaps they would permit a momentary digression beyond the frontiers of the classroom. For at least half a century most young pianists have had to learn by daily repetition a number of "pieces" of music. Any attempts to "play by ear", a process which corresponds in language to "saying something for themselves", have been frowned upon. The absurd consequence has been that most pianists can play, perhaps quite brilliantly, a number of works, but are so restricted to this musical recitation that they are musically dumb without a score or without a memorized item, and can neither read away from an instrument nor write a simple tune which they have heard, recalled, or imagined. That this iniquitous system of producing mechanical musical elocutionists is still common, encouraged by the music colleges' graduated examinations, may be demonstrated with

any group of students who enter college to take a music course. The error does not lie in the quite necessary inclusion of memorized and well-played items, but in restricting the musical education to this process. Returning to the classroom, the writer recalls a "B" class in a Junior School, the members of which were "composing" percussion scores, and the joy of a little girl in the "A" stream, who had "made up" a little tune for her recorder and written it down. In classroom music as in classroom "English" it is wrong to neglect essential learning for the sake of performance.

The second category we proposed to examine was the mechanical memorization of mathematical tables, a process which is obviously necessary even if the simplest arithmetical calculation is to be performed. When we follow immediately the expression "seven nines are" by the word "sixty-three", we are doing exactly what we should be doing if we followed the expression "as cool as" by the words "a cucumber". In each example the whole phrase is simply a mechanized sequence long since made automatic by usage. The human capacity for acquiring such useful habit sequences would be wasted if we insisted that seven heaps of nine objects, and every other combination, had first to be made and counted before the product could be accepted. What is necessary, however, in the memorization of this kind of table is that the process it represents should be thoroughly understood. The best procedure is that the basic principle should be learned empirically, that is, through the experience of performing the operation, and that this experience should then be associated with the expression used to describe it. If the expression used in multiplication tables is of the form "six fives are", the child should have been already familiarized with this expression by counting a number of equal heaps and stating the product he had discovered in the desired form. The process should be repeated until

the phrase corresponding to " x y 's are z " has become habitual as an association of a known process. One of the reasons why children find difficulty in working out simple problems which constitute applications of a process they have learned to perform efficiently is that the process has been learned mechanically, with no associated experience to give it meaning. Incidentally, it is by no means obvious, though often taken as a self-evident truth, that x groups of y will give the same result as y groups of x , that four nines must give the same product as nine fours. Any attempt to explain precisely, in very simple words, why this is so would reveal that this elementary mathematical truth is far from obvious.

There are two kinds of mathematical tables which children are expected to memorize: those which state the result of a process, as do the multiplication tables we have been discussing, and those which state the divisions and multiples of units of measurement. The value of the former kind is obvious and more tables of this kind might well be included in the process, as for example tables of addition. It seems ludicrous that the average child (or adult) could probably state immediately that "eight sevens are fifty-six", but would have to stop and consider before saying that "eight and seven make fifteen". The reader will probably recall for himself examples of the widespread inefficiency in simple addition and even of the surviving tendency to "count on the fingers".

Time spent on the second class of tables, however, might well be considerably reduced. Tables of weight, capacity, and other forms of measurement provide useful practice and variety in the application of arithmetical processes which have been learned, but there seems no good reason why the class should not be allowed to turn to the tables, at least at first, as a mathematician turns to his tables of logarithms, sines, and the like. Except for the passing of arithmetic

examinations in which direct reference to tables is not permitted, little of this kind of knowledge has for the average person more than an academic significance. Rods, poles, and perches, bushels and firkins, leagues and chains, roods, litres, kilogrammes, and many other such measures, rarely if ever occur in non-specialized adult experience, except when a harrassed parent is struggling with his child's arithmetic.

Reference to the memorization of definitions can be brief, for we have already discussed the process of learning which begins with vague perception and proceeds gradually to that degree of articulate clarity which enables a definition to emerge. Such a definition could then be usefully memorized, expressed in a correct form. It would be meaningful because it would carry with it all the associated experiences from which it had arisen. But to begin with a definition which has no such empirical content is to teach the child no more than could be taught to a parrot. It is fortunately rare nowadays to hear such a meaningless absurdity inflicted on a class as "A preposition is a word that governs a noun"; or such a false statement as "An adjective is a word that describes a noun", false, of course, because it is not the name of a thing that the adjective describes. But though rare, such definitions and their memorization by classes have not disappeared either from schools or from school class-books. If a class is shown a number of pictures and maps of islands and peninsulas, and asked to express in words the distinction between them, the definitions will emerge, they can then be associated with the words "island" and "peninsula" and with the visual perception of that which is named and defined.

In comparable fashion a general principle should now be emerging from the preceding discussions, that rote memorization is a valuable process only when it is meaningful, not

merely a machine-like reiteration. The memorized poem or prayer which is merely an automatically recited formula, the laboriously learned tables whose meaning has never been grasped, the imposed definitions of things which pass unrecognized, and all such unintelligent tricks of learning, may help a child to pass an examination, but they obviously have a very restricted educative value.

The last of the four examples we selected to illustrate the good and less desirable uses of rote memorization, the learning of lists of names, dates, and similar "facts", provides an example of its least desirable use. The teachers of history and geography used to be the greatest sinners in this respect, and ability to answer a "factual test" used to be considered far more significant than that the class should have been helped to discover why certain events had occurred or why certain things should characterize certain places, or why certain things should have happened when they did. If, in the higher age-groups, a chapter or group of chapters, whether descriptive or analytical, is read and understood as a whole, it is not difficult to superimpose any relevant detailed knowledge on such a basis, and such knowledge will then be meaningful. But the mere memorization of items of information, without a previously acquired background of relevant knowledge into which to fit them, cannot alone produce an intelligible synthesis. It will be observed that the principle behind all these examples is the same.

In isolating for discussion this valuable but easily abused process of learning, we have necessarily assumed that a teacher would rarely attempt to apply the process in such isolation. As has been previously suggested, it is important to bring to every process of learning any other relevant aids and as great a variety of associated experiences as may be practicable. The importance of this is implied in the

previous pages in the emphasis laid on the significance of meaning in rote memorization. There are times, however, when it is desirable quite deliberately to isolate the process so that all available attention may be concentrated on the act of memorization itself.

Suppose, for example, that a passage of prose or a poem has to be memorized by a class advanced enough to read it and to understand it, and that the passage is too long to be memorized as a whole. After the passage has been studied so that its meaning is clear and its form and style appreciated, it may be divided into sections, each of a length convenient for memorization and each constituting a natural division of the whole. The first section should then be studied, the text then turned over, and as much of it repeated without reference to the text as possible. The section is then studied again, turned over, repeated "from memory", and the process is repeated as often as necessary. The next section is then memorized in a similar way, and linked with the preceding one. By isolating the act of memorization in this way quite long passages of prose can be learned very quickly after a little practice. Repetition from the book is a much slower process because there is less necessary concentration on the act of memorizing.

CHAPTER VI

THE USE OF IMAGERY IN REMEMBERING

WE have already observed that the word "remember" is used in everyday speech to cover a number of distinct processes. Imagine that a class has been learning to recite a multiplication table by the process of repeating it several times, as described in the previous chapter, and that the teacher opens a new lesson by saying: "Let us see how much you remember of the table you were learning yesterday". Later the teacher begins another lesson by asking the class how much it remembers of something previously shown or said to it. In these two common situations the word "remember" refers first to a partially mechanized process, and secondly to the conscious recall of a visual or auditory experience. There may be and probably is a considerable element of conscious recall in the first instance, but there is no element of mechanized performance in the second. Something has been seen or heard, and nothing more has occurred, except possibly some mental response to the situation. The reader will recall that, for convenience and clarity, we are restricting the use of the word "remember" in this book to the second of the above meanings, that of conscious recall of an experience.

It will now be clear why it was emphasized in an earlier chapter that in every sensory experience something has to occur in the experiencer to constitute an act of perception. Obviously nothing can recur that has not already occurred, and remembering implies some form of recurrence of an experience just as mechanized recall implies the recurrence

of active physical experience. Sensory awareness can recur in two ways. In one the whole situation recurs; the stimulus, the physical response to it, and some degree of attention to it are all present again. When this happens we may say "I recognize this", which means "I know it again". Or we may react by saying "I have had this experience before".

We have already seen that this process of recognition is a very important, possibly the most important, learning process. Something is observed, observed again, gradually recognized, isolated and distinguished from other things observed, named, and thus *conceptual* knowledge grows. This expresses the difference between perceiving something without knowing what is perceived, and knowing what it is that is perceived. The child, with each recurrent experience, can be helped to make conscious the distinctions which separate this from other things perceived, as in the example of the scalene triangle earlier quoted, and so knowledge becomes gradually clearer, more exact, and definable.

In the second way in which sensory awareness can recur, the stimulus which originally evoked the experience is absent. When the teacher asked the class how much it remembered of the picture, diagram, film-strip or other "visual aid" shown previously, this visual stimulus was no longer present. By what process does the child answer the question? The child who produces an adequate answer to the teacher's question may do so as a result of one or other or both of two different kinds of process. First, he may see again "in his mind's eye" a fairly clear image of what he was previously shown and be able to describe it. Secondly, he may have noticed certain things at the time and, though he has no present image of them, can remember having noticed them. In this chapter we are concerned only with the former possibility, the recurrence of the perceptual experience in the form of "an image", when something is seen again

when it is not there to be seen in the form of an external stimulus; or when a sound is recalled, or some other sensation re-experienced, after the event which produced it.

It is common knowledge that many people, young and old, have very clear mental pictures of things seen previously.

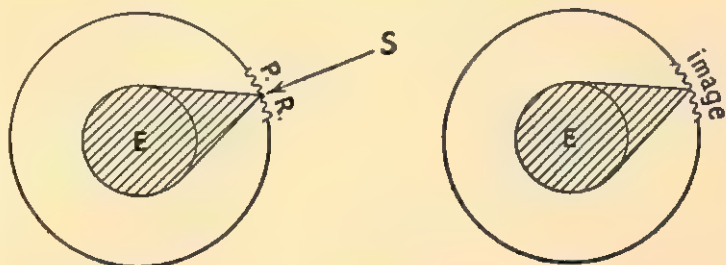


Fig. 6

COGNITION
Something is perceived.

IMAGING
*Recurrence of experience without the stimulus.
Example: "seeing in the mind's eye".*

A specially clear and vivid kind of visual image, called an "eidetic image", has the clarity and detail of a picture thrown on to a screen. Images of such clarity usually appear when the person is completely relaxed, as just before sleep. They come unbidden, stay awhile, merge into something quite different, and suddenly disappear. An attempt to recapture them almost invariably fails, nor can they be produced deliberately. More common and far more useful than these uncontrollable visions are the appearances of things and persons which some people can visualize deliberately. One may be asked, for example, if one remembers a person met previously, and, on being reminded of certain associated experiences, suddenly visualize the person. The image may "flash across one's mind" and disappear, or it may unexpectedly occur later, or not at all.

Common experience suggests, and psychological investigation has confirmed, that there are very wide individual differences in this process of mental visualization. The writer's visual imagery is negligible and virtually useless. Others, on learning a passage from a book, have such clear visual imagery that they can mentally "see" the words at the top or bottom of a page, the beginning of a new paragraph, or the number of the page on which such a passage occurs. Between these two extremes there is, of course, a widely diverging range, but there are certain demonstrable qualities of such imaging that the process must be regarded as one of restricted general value. Often, when there is apparent dependence on it, there are other and more influential factors present. Perception is usually of wholes and is rarely analytic; consequently images tend to be of such perceived wholes, and are not sufficiently clear for subsequent use.

The reader may demonstrate this general quality of visual imagery for himself. Suppose that the effort is made to visualize the face of a familiar person who is not present or of a well-known scene. Excluding as far as possible things otherwise known, the reader is asked to describe the face or scene from the image. There are many who can do this, but there are many who cannot deliberately create an image at all, or, if they can, find it too vague for description. The reader may be able to form at will a fairly clear mental picture of a horse or a cow; but, unless he happens to be trained in the analytical observation of these animals, as a painter might be, an attempt to draw one "from memory" or from the image usually reveals how little of its structure is known and how restricted is the use of such mental pictures for this purpose.

This quality of visual imagery is further illustrated by the process by which the appearance of something seen is best

recalled. Reference to details, which were quite possibly not even noticed at the time, is of little or no help; but reference to the whole situation may bring back the mental picture. For example, imagine that someone is trying to help a friend to recall someone previously met. He may attempt to describe the person, or he may try to reconstruct the whole situation, describing the occasion and any associated circumstances. He may say, for example: "He sat at the window-table in the dining-room of the hotel where we stayed last year; he usually came in late; he insisted on having the window closed". This method of assisting recall is far more likely to succeed than is that of analytical description, and, in the classroom, provides a further example of the previously stated principle that learning proceeds *towards* greater clarity, articulation, and definition. A factual summary does not necessarily produce an intelligible or recognizable synthesis.

Auditory imagery reveals a similarly wide range of individual differences, and it is more difficult to isolate it from contributory factors than it is to isolate visual imagery. Of these factors two are important. First, when something is heard, often something relevant is seen, and the visual association may be called in to assist the aural image. For example, a person was asked if she could mentally recapture the sound of a bassoon, an instrument she had never played but had heard many times. After closing her eyes and adopting an attitude of intensely concentrated listening, she replied: "Yes, but first I had to imagine I could see someone playing one." The second intruding factor is that the actions involved in producing certain auditory experiences can themselves be mentally reproduced, as a musical melody may be "sung to ourselves" or "played in imagination" on a familiar instrument. This is what usually occurs. To discover mentally, for example, how many notes of the

British National Anthem "go down at the end", the normal procedure is "to sing the tune to oneself". One does not try to recapture the sounds as they were last heard.

All the sensory experiences may recur in this imaged form, and the characteristics of visual and auditory imagery are equally the characteristics of other forms of mentally recalled sensory experience. An odour or perfume may be recalled as an olfactory image, a taste as a gustatory image, or the "feel" of something as a tactual image. In some areas of school experience, as in the study of domestic science, or of chemistry, or in some forms of handicraft, some of these forms of imagery may enter, though the recognition of differences in these fields of sensory experience is more important than their mental recall in the ordinary techniques of teaching. Certainly none of them has so wide a range of usefulness in the classroom as either visual or auditory imagery has.

In discussing auditory imagery we said that "the actions involved in producing certain auditory experiences can themselves be mentally reproduced". As an illustration of the general tendency to rely on this capacity rather than on an auditory image we said that most people, if asked a question as to the structure of some well-known tune, would probably "sing it to themselves" in order to answer the question. Some people, most people probably, can remember something when they have written it down; a diagram can be remembered better when it has been drawn; the cricketer can feel the action of a batting stroke, the pianist can feel the movements of a familiar passage in his fingers. Even in thinking, the imaged words tend to occur not as imaged sounds but as words spoken in thought. This class of "imaged" action is known as motor imagery or *kinesthetic* imagery. The word "kinesthetic" (or "kinaesthetic") is derived from a word meaning "to move"; "kinematography"

is the making of pictured movement or moving pictures. Kinesthetic imagery is the recurrence of sensations of action or of movement, and is in far more general and constant use than is any other form of imagery.

One reason for the special usefulness of kinesthetic imagery is that more detailed events have to occur in action than are necessary or usual in perception or recognition. A word may be recognized at a glance, but if it has to be written at least an attempt has to be made to spell it. Perception, as we have already shown, is generally of some whole, form, or shape; it is often vague and ill-defined; but the reproduction of anything perceived demands a more intimate knowledge than this. In the teaching of a new song to a class by the process of imitative repetition, if the song is too long to be memorized as a whole, some section of it is sung and then repeated by the class. The implication in this common procedure, an implication which is correctly assumed, is that only a relatively small section of the tune will be recalled aurally long enough to permit the accurate translation of the fleeting image of sound into more enduring reproductive actions.

A number of general principles may be deduced from this brief discussion of the nature and functions of imagery, and it may be helpful to the teacher for the more important of these to be summarized.

(1) As the teacher has to cater for a wide range of individual differences in the natural dependence of children on one or other form of imagery, *classroom experience should be as varied and comprehensive as possible.*

(2) Because of the more enduring significance and special characteristics of motor imagery *it is desirable to include as much writing, drawing, speaking, handling, and any other relevant actions as may be practicable.*

(3) As any form of imagery is a form of recurrence, both

the frequency and the intensity of previous relevant experiences influence the quality and the intensity of their recall. *Each such experience, therefore, should be as full, clear, and meaningful as may be desirable at that stage, and at each successive stage.*

(4) As initial perception is generally restricted to that of rather vague wholes, *it is often necessary to help the class to observe what particular quality or relationship the teacher wishes the class to observe.* With such guidance a new interest may be stimulated and a perceptual experience made more meaningful and, therefore, more memorable. The usual atlas-map, for example, is so packed with detail as to be virtually useless except for purposes of reference. But suppose that a teacher has pointed out to a secondary-school class that the English Channel and the Gulf of St. Lawrence lie on the same parallel of latitude, and that the class has seen a picture of the frozen St. Lawrence. The interest of the class will be stimulated as to why the English Channel is never frozen. The children have been helped to observe something specific and interesting; as the perceptual experience has been enriched and extended, so there is more to recur.

(5) Because images tend rapidly to fade, they need frequent restimulation. *The more recent an experience and the more often it has occurred, the more likely it is to be remembered.* An important factor in the application of this old principle of teaching is that it is not sufficient merely to provide the opportunity for something to be perceived with any possible degree of frequency; the experience that has to occur and recur is an interested act of perception. Pictures and diagrams are not necessarily remembered better because they are ever present before the children's eyes; pictures which hang permanently on the classroom wall have probably long ceased to be observed at all.

CHAPTER VII

REMEMBERING THROUGH ASSOCIATION, OR BEING REMINDED

ONE of the points which emerged from the discussion of imagery is that an experience is more easily recalled if one is reminded of something associated with the original experience. Though we were discussing only one kind of experience and its recall, the recurrence of perceptual experience in the form of an image, the principle of associated recall is one of much wider application. We have already seen that habit formation and the development of skills are mainly dependent on the tendency of associated motor events to recur in such association, and that each recurrence facilitates the tendency until the association becomes automatic.

The principle applies similarly to the association of motor events and cognitive events, that is, events which involve the experience of knowing. Experiments have shown this to be true even of the animal world. If a bell is rung in the hearing of a hungry dog which is being shown food, repetitions of the associated experiences produce the situation in which the ringing of the bell is sufficient to stimulate the dog's salivary glands. Such a response is described as a "conditioned" response. The extent to which we learn unconsciously to adjust our actions to situations is revealed by the shock which accompanies a false adjustment to an unexpected stimulus. If we go to lift a kettle which we expect to be full but which has been emptied, our arm rises unexpectedly, to our surprise. The restimulation of interest

by the introduction of some change in a familiar situation, as discussed earlier, is essentially dependent on the same principle. In learning to read aloud, the child has to perform quite complex vocal actions in response to a visual stimulus, as the young instrumentalist has to perform complex manipulatory actions in response to the musical score he may be learning to read. After a time the required actions, the motor events, become automatically associated with the visual symbols, the perception of which constitutes the associated cognitive event.

In this chapter we are concerned, however, with the association of cognitive events, that is, events which involve "knowing". However capricious or accidental may be such an association, if it is sufficiently impressive at the time, or if it should recur often enough, the recurrence of either item tends to the recall of the other as automatically as though the items were necessarily related. An amusing example of this may recall other examples to the reader. Two teachers were being driven in a car by the writer. One, a church organist, noticing the number 391 on an approaching car, said: "That's 'Onward Christian Soldiers' in *Ancient and Modern*." As 540 appeared, he said "Fight the Good Fight". The next car was 1381, and the second teacher said "Peasants' Revolt".

Most people make use of the process by suggesting some associated experience in order to "bring something back to the mind", choosing if possible something sufficiently unusual to be likely to be readily recallable in itself. For example: "Surely you remember Professor X! He is the one who always used to ride a tricycle." A place may be recalled if one is reminded of a memorable incident which occurred there. Superstition is based on generalizations made from specific associations. The process has been commercially developed in what is wrongly described as "Memory Training", in

which deliberate associations are made to help the recollection of particular items.

Now let us return to the classroom.⁹ A very great proportion of a child's learning is through words and is expressed in words. This must always be so, for language is necessarily the most frequent medium of communication, however extensively other forms of learning are employed. Most words and word-groups have no intrinsic meaning; other words would serve equally well, as they do in other languages. If words are to be intelligible, however, we can hardly adopt Humpty Dumpty's scornful procedure and say "When I use a word it means just what I choose it to mean—neither more nor less." Yet, as we have observed earlier, words are generally used intelligibly even when it would be difficult or even impossible to say, in other words, what they mean. Most frequent words and word-phrases derive their meanings through association, and often such meaning can only be demonstrated. For example, the meaning of colour-words is learned only through the association of a perceived colour with a word. There is no other way of learning the meaning of colour-words, and no way of "explaining" such words except by demonstration.

Words, then, most frequently derive meaning through having become automatically associated with something known through repeated experience. A point of importance to the teacher is that this association does not normally work equally well in both directions. For example, a name tends to recall that which is named more readily than that which is named recalls the word. This is because that which is named must be recognizable in order to be consciously connected with the word, and this implies that it has a unique or a categorical quality. This is so, for example, of whatever we have learned to associate with proper and common nouns respectively. But words are merely different

sounds, and only repeated usage gives them independent significance. *Whenever a class, therefore, is intended to remember names, words, or word-phrases of any kind, the words should, whenever possible, be related to an already known experience, and the words should be used as often as possible in such association.*

It is not always possible to observe this principle, but this unfortunate truth does not excuse the frequent tendency not to observe it at other times. The teacher who complains with some justification that much of contemporary psychology is cluttered with words which are unintelligible to him often forgets that much classroom teaching is equally as cluttered with words equally as unintelligible to the child. In arithmetic, for example, though examples could be drawn from every type of lesson, how many children of a class performing the relevant processes really understand the meaning of a factor, a multiple, least common and highest common, cubic content, and dozens of similar terms, even if they have learned by rote a definition of them?

In geography, words can derive meaning from associated knowledge gained from maps, models, pictures, films, filmstrips, diagrams, and all such invaluable visual aids. History presents, from this standpoint, a more difficult problem, for much of its normal content lies outside the child's possible experience or even its analogous experience. The old practice of making a class learn a quantity of names and "facts" is, fortunately, dying, but, like Charles II, is taking an "unconscionable time" in the process. Characters and events of history can at least be associated as in intelligible narrative *before* an attempt is made to memorize any relevant names, or other factual details. Emphasis can be laid on human motives of behaviour, which change but little in any age. The common interest of young and old in the domestic lives of famous people reveals the desire to find the person

behind the familiar name. Illustrations are, of course, indispensable, and the geographical background often helps to make historical narrative more intelligible.

Another classroom application of the principle of associated recall is the use of mnemonics, that is, of artificial reminders. These are useful when there is no relevant association available, or as a temporary device when the correct association cannot yet be established. For example, usage will in time familiarize a young musician with the distinction between a quaver rest (7) and a crotchet rest (3), or between a semibreve rest (—) and a minim rest (—). In the meantime error can be avoided to a considerable extent by suggesting that the quaver rest turns the same way as does a 'q', the crotchet rest the same way as a 'c', and that a semibreve, being worth two minims, falls below the line, just as something heavier would. In general, however, such devices are not very desirable, as they depend, by definition, on false relations. Whenever possible it is better to allow the correct relation to develop in its own time.

The principle of association is of general application, affecting all events, whether kinesthetic, cognitive, or emotional. The recollection of an event may evoke a feeling of joy or sorrow, a blush, or a sense of fear. An emotional event is more easily recallable in most instances, because it is an intense experience. One such experience may permanently fix an association. The satisfaction of successful achievement, the joy of discovering something for oneself, the moment when the items of a baffling problem seem to form suddenly an intelligible pattern, the word of encouragement or appreciation of effort, are experiences which sometimes live long in the memory. A child's classroom experiences are always complex, influenced by emotional and other factors which, though they may be intruding irrelevancies, are associated experiences. Some such factors

can enrich the experience; some, particularly fear, can sterilize the effort.

Recall through association plays, therefore, a great part in learning. It influences the development of skills and the formation of habits, desirable and undesirable; it gives meaning to language, musical notation, and to symbols in general; it provides aids to memorization, and influences even our emotions and associates these with recallable events. Yet the process has a restricted scope. Associations, as we have used the word, are not *necessary* relationships; they are often purely coincidental and personal. The process, therefore, cannot be a continuous one, it implies even some distraction of attention except when the association is deliberately and purposively emphasized, and it is not an orderly process of thinking, for such depends on the perception of necessary relationships. It is to these that we now have to turn.

CHAPTER VIII

REMEMBERING THROUGH UNDERSTANDING

WHEN a teacher is concerned not so much with the question of whether a particular item of information has been remembered but rather with how much of a particular lesson or experience has been remembered, the main two controlling factors are: (1) to what extent was active mental interest maintained during the lesson, and (2) how much of the lesson was understood. How to maintain the active and intelligent interest of the children in the task in hand is probably the teacher's most important and constant problem. When engaged in some enjoyable manipulative art or craft, or in some interesting experimental work, or in any form of kinesthetic activity, the class is obviously *doing something*; the moment when individual or more general interest ceases is apparent, and what is being done can be individually checked as to its quality and quantity. The situation is quite different when the class is engaged in *looking* at something or in *listening* to something. A great part of classroom experience necessarily depends on looking and listening, and the problem we are first to consider is that of keeping a class as busily and as interestedly occupied when thus engaged as it would be if engaged in some enjoyable manipulative skill.

Visual experience differs from auditory in one important particular: auditory experience is continuous, an unfolding process; in visual experience everything seen is simultaneously exposed. This is, of course, absolutely true of

all still pictures, or maps, or diagrams; but even films and television differ from still pictures only as a complex orchestral item differs from a single voice or instrumental solo. At any moment what is to be seen of the unfolding picture is to be seen at once. In a continuous narrative the mental response is completely directed: the experience is intelligible or not, interesting or not; there is no time to stop and consider, or to stop the voice for a moment to pursue some interesting side-issue. In studying a graphic illustration of any kind there is time to do all these things, to look at any one part of it for as long as one wishes, to return to any part as often as one requires, or to select any part for contemplation. But the advantages of either experience are the disadvantages of the other, for in visual experience, other than looking at a film, mental activity is not directed as in auditory experience, but can wander vaguely and aimlessly, in a totally unprogressive fashion.

It follows that oral lessons should in general be short, especially for young children, and that the teacher should keep a finger on the pulse of the class in order to detect any flagging interest. Once a child's interest is diverted, the child may cease even to hear what is being said, and will be left behind as the talk, now probably unintelligible, proceeds. To be successful the oral lesson has to bring the class actively into the experience, whether it is absorbed in some dramatically interesting narrative or stimulated to discuss, comment, or question. As the typical visual lesson needs oral help to direct the class along a progressive line of thought, so the oral lesson gains from visual aid, which reinforces and enriches the auditory experience, and provides a refreshing diversion. But whether the lesson is mainly oral, visual, or kinesthetic, or any of these in combination, the essential points are (1) that a lesson is necessarily a continuous event, (2) it should be a coherent and progressively

developing experience, and (3) if it is to be remembered it must stimulate a similarly continuous and coherently progressive experience in the class. The following description of a classroom technique which the writer observed is included because it illustrates a combination of visual, aural, and kinesthetic experiences, their purposive direction and control by the teacher, and the maintenance of relevant mental alertness by the class.

The teacher's object was that the class should learn to draw sketch maps "from memory", but the process can be applied equally well to simpler skills and younger children. Each lesson was restricted to one main item, such as that of learning to draw an outline map of India. First the class was given a few minutes to study the outline, to notice its general shape, as though it were drawn in straight lines, and its main proportions. Its attention was directed to the positions of Karachi, Delhi, and Calcutta, and to noticing that the distance of Delhi from southern India was approximately equal to that between Karachi and Delhi. The maps were then turned over and two minutes were allowed for the sketching of an outline as lightly as possible, without referring to the map. With pencils "down" the children turned back to the map and compared it with their sketches. Other points were called to their notice, the maps turned over again, and corrections made "from memory". The process was repeated several times, and finally a new map had to be drawn. The essential point is that nothing was done to the sketches while the map was exposed. When the writer saw this class it could draw a great many adequate sketch maps, and obviously enjoyed going so. (Fig. 7).

This process may seem at variance with the principle that errors should be avoided as far as possible in the development of a skill. The process is, however, comparable with that which begins with a vague general perception and

proceeds to more accurate knowledge. Inaccuracies of the early attempts are not due to carelessness, but represent the early stages of this knowledge. They are, moreover, immediately corrected or, rather, there is a progressive

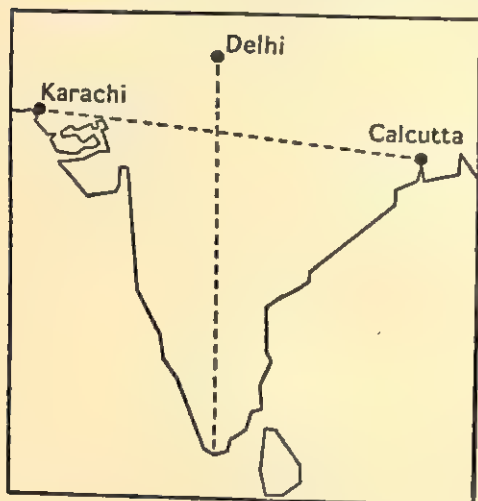


Fig. 7

approach to greater accuracy. The processes involved are essentially similar when a class is asked to give verbal or written descriptions, summaries, or comments on something it has just heard. The voice has ceased, just as the map was turned over. When any visual aids are used a similar technique can be applied, by

directing attention to relevant points while the picture is exposed, and asking for recapitulatory comments when it is no longer visible. In this way the maximum attention is maintained and observation is guided in a progressive manner. Nature study and other approaches to scientific interests provide excellent opportunities for practice in intelligent observation, and this technique can be adapted to the needs of any age-group.

In descending order of merit are three other common practices: (1) description or drawing directly from the object or picture; (2) the teacher's monopoly of the descriptive process; and (3) dictated notes. The first involves no effort to remember what is seen, and neglects training in

intelligent observation. What is observed will depend on chance factors, while progressive observation, lacking direction, can occur only fortuitously.^o In the second process the teacher is doing what the class should be doing, and unless the children are listening with a similar degree of concentrated attention to that which they might give to an interesting story they will be unlikely to remember much of the lesson. They are themselves doing so little that there is little to recur. In the third process the teacher not only does the first of the children's tasks but provides them also with a final summary, not of their experience, but of the teacher's own experience. Moreover, the writing of transcribed or dictated comments and notes is sufficiently a mechanical skill to permit considerable "wandering of the mind" during the process. Many teachers may think of exceptions to these general statements, but a general principle is not invalidated because there are occasions when it may seem better not to apply it. *The general principle here developed is that lessons are good if they involve the class in interesting, progressive, mental activity towards an end, the worthwhileness of which must be left to the teacher's own judgment.*

The children's mental response to different kinds of classroom experiences may take many forms. It may, for example, consist simply in following a story intelligently; or it may be a progressively developing knowledge, which may be descriptive, or analytical. It may be a struggle to perceive some shape, meaning, or purpose in something which has none of these things, until suddenly the meaning is clear, and hitherto unrelated items merge into meaningful unity. In any such mental process the effect on remembering is similar, for what is most easily remembered is the story, not the words, the interrelated whole, not the parts. Suppose one is presented with an apparently meaningless series of

numbers and asked to remember it, as, for example, such a series as: 149162536496481. It is, of course, difficult to remember such a series, and memorization would depend on mechanization by repetition. But if one happens to notice that the series is one of the squares of the first nine numbers the series can be repeated at any time. The series is now intelligible: 1, 4, 9, 16, and so on.

An old slogan which expresses one aspect of the general principle developed in this chapter states that "*Why*" is *more important than "Who, What, When, or Where"*. Most young children reveal a great interest in purpose, cause, and reason; and, though senseless and habitual questioning is a nuisance which it is absurd to tolerate, intelligent curiosity is simply "wanting to know", and is therefore an attitude worthy of encouragement. Yet, instead of encouraging it, much school work by its exaggerated insistence on "factual knowledge" tends to destroy it. To know why is often not only the best way of remembering what, but the only relevant factor that it is necessary to remember deliberately. Often, too, it may be a matter of greater interest. For example, the fact that great quantities of tobacco are landed at Bristol gains interest and is more likely to be remembered when it is related to the history of the early slave-traders of Bristol and their part in the "Triangle of Trade".

There are times when we can provide no answer to the question "Why?" not merely because we ourselves do not know, though this may occur often enough, but because no one knows, and all that is possible is to provide a reasonable, intellectually satisfying hypothesis. Sometimes what may be regarded as an explanation is not one. A story which illustrates this may interest the reader. Two children were playing in a garden in the autumn, and the younger said "I know why the leaves fall; the fairies throw them down." The elder child said "No! They explained that at school.

They fall because of the Law of Gravity". The point of the story is that it was the younger child who provided an explanation; the elder merely said the leaves fall because things fall, which may be true but explains nothing. That the younger child's explanation would not be generally accepted is irrelevant.

Most explanations are only partial explanations, going back one or more stages in an infinite and ever-widening chain of causes and effects. One wheel turns because another turns it, and so on, until with Aristotle we reach the problem of a beginning and a Prime Mover. Usually it is the very young children who tend to drive the patient teacher or parent into remote metaphysical mysteries. More immediate causes and purposes usually satisfy the needs of the pre-adolescent age-groups who, if interested enough to ask for explanations, are likely to be concerned with immediate and specific problems; but all age-groups would suffer from a teaching process which laid greater stress on the acquisition of information than on the understanding of knowledge and the encouragement of intellectual curiosity.

How different in significance to a class two lessons on the same topic can be may be illustrated by the following description of two such lessons which the writer observed. In two different schools a class of young children was having a series of lessons on homes in different parts of the world. In one class the children were each given a tray of fairly softened clay, to represent the ground, and some straight twigs. They were told to start to make a model hut in any way they pleased. Inevitably they began to make the wall of the hut by pushing the twigs vertically into the clay (most of them, incidentally, making a round hut though no guidance was given). They were then interrupted, and some of the obvious difficulties, such as the construction of a roof, were discussed and suggestions were made. It was pointed

out that these were just the problems people had to solve when they had only this kind of material to make their homes, and the question arose as to how they solved these problems. It was then that pictures of the huts as actually constructed were shown. The other lesson began by showing pictures of these huts, and though models were afterwards made they were merely representational copies made of paper, sticky tape, and water-colour paint. This group knew what the huts looked like; the other group knew why the huts were constructed in that particular way.

A general comment on this chapter may be helpful. Understanding implies the seeing of things in relationship, in their necessary interconnections. Remembering through understanding is, therefore, a much more significant process than remembering through association, for, while associations may be merely fortuitous, relationships, as the word is used in this book, are permanent, for all to see. A may be the cause of B, or the effect of B, or the reason for B, or part of B, or bigger than B, or opposite to B, or earlier than B, or simply on or under B; but whatever the relationship between them it is there to be perceived. Explanation consists in bringing items into such relationship, into some comprehended orderliness, as, in a jig-saw puzzle, the tumbled fragments have to be brought together into intelligible unity. It is important to observe that the process of understanding implies mental activity, and, because of this, that it takes time. To some aspects of this process later chapters of this book are devoted; it is sufficient at this stage to remind the reader that, as in the series of figures quoted on page 54, once the essential relationship has been grasped, remembering becomes a much simpler and more certain process.

CHAPTER IX

REASONS FOR FORGETTING

THE purpose of this chapter, which may be described as "a brief recapitulation in reverse", is to help teachers to discover the probable reasons for a child's "forgetting". It will already be clear that learning and remembering depend on the efficient functioning of a number of different and largely independent processes, that aptitude for one form of learning does not necessarily imply a like aptitude for other forms, and that, while some of the factors which influence the success of any learning process are of individual significance, others are inherent in the classroom situation. Learning and remembering are complex processes. It follows that failure to remember cannot be dismissed simply as "due to forgetfulness", and that to discover why something has been forgotten or is being forgotten is important, both in determining how to give individual help to a child and in checking a teacher's own classroom procedure.

Let us consider first the child who fails to remember something when asked a question, and examine the factors in the immediate situation. The attempt to recall a forgotten item involves effort, and it is a general experience to find that items of knowledge, even well-known ones that are momentarily forgotten, tend to elude deliberate attempts to recall them. *The effort to remember is specially unsuccessful if there are adverse emotional conditions present, such as fear, or shyness, or the diverting influence of the pressure of time.* Much depends on the child-teacher relationship, on the child's sense of security, freedom from pressure or any form

of tension, such as concern about the consequences of forgetting. These characteristics of trying and failing to remember are, as was stated earlier, specially characteristic of attempts to recapture an image, but they are qualities of all forms of deliberately attempted recall, and apply to all age-groups. The writer recalls a student of outstanding ability who, through quite unwarranted fear or "nervousness", answered two of four questions in an examination, then lost all self-control, and afterwards said that everything seemed to have gone out of her mind.

If a child fails to remember something when asked, and if there are no adverse factors in the immediate situation, either in the child's attitude to it or objectively in the situation itself, such as might be present for example in a timed or competitive test, there are usually three possible groups of causes, one or more of which may be responsible. First, *that which has been forgotten has not occurred as a conscious experience often enough for its recall to occur immediately and at will.* Knowledge, particularly that which depends mainly on either rote memorization or on association, resembles habit formation and the acquisition of skills in that each occurrence of the experience tends to facilitate its recurrence. The frequency of the recurrence of relevant experience is especially important as a factor of recall in all knowing which is not dependent on understanding. For example, much spelling, particularly of English words, is not dependent on any consistently applicable rational principle, and, therefore, the relevant learning is essentially dependent on the frequency with which the spelling is known at the time, as in the writing of words correctly.

Incidentally, there is a difference between a child's persisting to spell a word incorrectly though the child knows how the word should be spelt, and a child's failure to remember how to spell a word. It is the second form of

forgetting we are now considering. The first is an example of the persistence of an already established habit, sufficiently fixed and mechanized to function when the child is thinking of something else, and not yet replaced by a new habit.

The second group of reasons for failure to remember when there is nothing in the immediate situation to explain it, is that class of influential factors which control the quality and the intensity of the original experience. *So little may have previously occurred that there is little of relevance to recur.* We began this book by stressing that every classroom situation constitutes for each child a *potential* experience, and that each child's *actual* experience may differ in content and intensity from that of every other child in the class. To such experience each child brings its own degree of general intelligence, its special aptitudes, its own interests, coloured by its own earlier relevant experiences, its home life and general environmental conditioning. We emphasized too that there are controlling factors in every classroom situation which may influence the degree of attention given by individual members of the class to what the class is doing. Not to know something of this experience later, therefore, may not mean that the child has forgotten something, but that the child has not known it, or that a vague awareness left no "impression". Nothing can recur that has not occurred. The commonly used expression that certain experiences "leave an impression on the mind" is a useful reminder that, as such "impressions" tend to fade, the strength of the immediate impression, its recency, and the frequency of its recurrence, are the essential factors which influence its lasting quality.

The third reason for forgetting, and the most important when applicable, is failure to have understood that which was to have been remembered. Not all branches of learning are capable, all the time, of stimulating that form of mental

activity which leads to understanding, to the perception of cause and effect, of other relations, or of pattern and design. When something has been understood, however, the difficulty of remembering it is at least reduced, and may have been eliminated. It is with the nature of such mental activity that the next section of this book is concerned. It is sufficient for the moment, therefore, to stress that *failure to have understood is a very frequent and influential cause of forgetting.*

So far we have considered the failure of a child to remember something when called upon to try to do so. Different is the situation when a child forgets to do something, or continues to forget to do something which it is being trained to do, or continues to do something which it is being trained not to do. As we are discussing reasons for forgetting we are assuming in such instances that the failure is not due to other causes than failure to have remembered.

All such examples of forgetfulness occur in those processes which depend essentially on habit formation. Although the desired end-state of training in any such processes is that it should be possible for them to function without one's having to think about them, one has to think of them before this end-state is reached whenever deliberate training is involved. Forgetfulness, therefore, may be due in any such processes of learning to the same causes as is forgetfulness in the purely mental processes. There may be adverse factors in the immediate situation, particularly some distracting thought or diverted interest. Previous relevant experiences may be influential, particularly those which have led to the fixing of habits and actions which have not yet been superseded. Here again the reason for forgetting may be that no intelligent interest in the activity, action, or behaviour has been aroused. The poem to have been memorized may not have been understood or found interesting; the action to be performed or

the behaviour to be adopted may seem to the child to have no intelligible purpose. To understand and to accept the reason why something is to be done or not to be done not only helps the child to remember, but is important also because it tends to reduce and possibly to eliminate any resistance involved in the effort to act as desired.

The reasons for forgetting, therefore, are complex; but they are not necessarily difficult to determine in particular instances, whether they lie in the immediate situation, or in the quality, intensity, recency, or frequency of previous relevant experiences. In so far as "to forget" means "failure to have learned" as distinct from momentary inability to recall something known, probably the most important single principle of successful learning and remembering is that the child should be taught to think: to think of what it is doing or ought to be doing; to think about what it is doing; and to understand what it is doing. To this aspect of learning we now have to turn.

PART THREE

THINKING

CHAPTER X

FOUR WAYS OF THINKING

MANY volumes have been written on "thinking", or on some aspect of it, by philosophers, psychologists, poets, and by many who are none of these. Considerable simplification is necessary, therefore, if the topic is to be reduced to the dimensions of practical classroom requirements. The topic, furthermore, is obscured by the many different ways in which the word "think" and words derived from it are used in everyday speech. As we are concerned only with trying to discover what happens when "someone is thinking", that is, with the nature of a process, we can reject as irrelevant all other uses of the word. For example, the expression "I think so" means "That is my opinion", which is quite different from the meaning of "I am thinking", though the opinion may be the result of thinking. Again, the expression "I often think about you" means "I often recall or remember you", and does not imply what "I am thinking" implies. If we happened to notice a person, and came to the conclusion from what we observed that he was thinking, we should expect him to be in a state of mental concentration, "lost to the world"; it would be intelligible to ask him what he was thinking about, but the intrusion would interrupt the process. It is this process which we have to examine.

The essential characteristics of thinking that begin to emerge may be summarized. First, it is clear that, when thinking, one is doing something; one is engaged in some active process, even though it is a mental one. Secondly, because thinking is a process, it "takes time"; that is, it is a continuous event. Thirdly, thinking involves such a complete concentration of effort or attention that any interruption, any distraction, or anything more than the vaguest synchronous awareness of anything else, stops the process. Lastly, the process must be concerned with something or other; to be thinking, but not to be thinking about anything, is meaningless.

Thinking may take several different forms, and in this chapter we propose to discuss four of them. First let us try in imagination to set the process in motion in a classroom, by showing the children an object, a pencil for example, and asking them to think about it. We should probably observe that in most cases the process was rapidly exhausted; but let us suppose that one member of the class appears to be more successful than the others, obviously having "lost himself" in some mental process. If asked to describe the course his thoughts had taken, he might provide something of the following character:

"When I was looking at the pencil I remembered that someone had told me that pencils were often made of cedar wood. I know when a pencil is made of cedar wood because it smells nice. I thought of this in the scripture lesson this morning, when it said that Solomon covered the walls of the temple he was building with cedar wood. I thought it must have smelt nice. The cedar wood came from Lebanon in ships. I'm not sure where Lebanon is, but Hiram King of Tyre sent it, so I suppose it's in Tyre, wherever that is. Then I thought this hasn't much to do with pencils. Pencils are used for drawing, and doing sums, and writing.

I wondered what that pencil had written. I expect it's written 'very untidy; do it again!'. . .

This kind of mental meandering is typical of a very great proportion of ordinary thinking. It consists in moving along a series of associations, each of which serves to recall the next. It is a pleasant mental occupation, like day-dreaming, or "letting the mind wander". Though it lacks orderliness, purpose, direction, or arrangement, it has important uses in the classroom, for it is the preliminary stage in most thinking processes, and provides the material which can subsequently be brought into more orderly interrelationship. The following classroom technique, this time a genuine one, illustrates this point.

The method was applied to the writing of compositions in a Secondary Modern School by a teacher who insisted that every composition should be presented in three separate stages. The first, which the class called "the heap", consisted of relevant ideas written down as they occurred, and demanded the kind of rambling through recalled associations previously described. The second stage consisted in the arrangement of a selected number of these jumbled ideas into related groups, each of which provided the material of a paragraph. Finally the essay was written. The first stage provided, as it were, the tumbled pieces of a jig-saw puzzle; these were then grouped in separate heaps as, in the jig-saw, the blue pieces, the green bits that looked like parts of trees, and the grey fragments of a church, might be gathered together before the final assembling is attempted. A similar order of mental events occurs, too, when a problem is presented and solved. The data, as presented, seem at first unrelated; then their patterned interrelationship is gradually perceived, and the meaningful unity is grasped.

In its simplest form this second process is that of the classification type of intelligence test, in which the child is

given the names of four items of which three are classifiable and the fourth has to be rejected. Given, for example, "violin, viola, flute, and chair", he would first have to discover that the first three of these are names of musical instruments, and "chair" would be rejected from the class. But if he were given "violin, viola, flute, and violoncello", all of which are names of musical instruments, he would have to carry the process a stage further, and notice that three of these names are of stringed instruments and "flute" would have to be rejected. It will be observed that the process, even in this simple form, involves the application of knowledge.

Sometimes, when certain items have been brought into orderly arrangement a new item of knowledge may emerge, a possibility that is the most interesting and the most valuable of the qualities of thinking. Let us consider a very simple problem. Several people are wondering which is the elder of two boys, Albert and Edward. Someone supplies the information that Albert is older than Charles; a second adds that Bernard is older than Edward; a third adds that Bernard must be a lot older than David, because David is younger than Edward; a fourth adds that David and Albert are of the same age. All the relevant data have been accumulated into a jumbled heap. Arranged in an orderly fashion, the separate items when interrelated reveal the interrelationship of all their ages, including that of Albert and Edward, which was required.

(1) Jumbled items as given: $A > C$

$B > E$

$E > D$

$D = A$

(2) Items arranged:

$B > E > D = A > C$

(3) New item:

$E > A$

By referring to the data from which a conclusion has been drawn it is possible to supply a *reason* for accepting the con-

clusion as valid. If the data are known to be accurate and if the conclusion is correctly drawn, then it is not only a valid conclusion but is also a true one. The process of arriving at such a conclusion is known as "reasoning". Because the ability to reason well is a rare human achievement it would be wrong to assume that little attention need be devoted to the development of the process in the classroom. Every teacher of infants knows that very young children reveal an awakening interest in trying to discover the reason for this or that, and have themselves begun to reason. In common with all human capacities, reasoning improves with practice and training, and tends to atrophy without practice.

The conclusion which is inherent in an orderly arranged series of data, the conclusion which is there to be "drawn out", is called a deduction, and classroom problems are usually of the deductive kind; there is an answer to them. Theoretical geometry is a process of deductive reasoning, in which, step by step, some inevitable conclusion is reached. Everyday conversation is sprinkled with examples of it, though not necessarily expressed in an obvious or formal way. For example:

"I didn't know John had to learn Greek."

"He does. He goes to St. Martin's, you know."

"So does Harry, but he doesn't take Greek."

"I expect he takes Extra Maths. They have to do one or the other."

"Doesn't John do Extra Maths?"

"No. I told you; he takes Greek."

Expressed formally, this argument would run:

All at St. Martin's take Greek or Extra Maths.

John goes to St. Martin's.

He does not take Extra Maths.

Therefore, he takes Greek.

A more adventurous kind of reasoning is that known as

"inductive," in which "the mind leaps" to some imaginative possibility suggested by the data but not implied by them. Such an inference, of course, may or may not be true, and it is a common tendency to jump to conclusions on very inadequate grounds. The commonest form of inductive reasoning is that which proceeds to the assumption that because something is true of some it must be true of all. Unless the "some" is equivalent to "all known", such an assumption is quite unjustifiable, but that does not prevent its being made.

The process again begins in infancy. Children at first unconsciously and then consciously tend to regard the familiar conditions of a fairly consistent environment as generally typical, and have to discover, for example, that the rough treatment tolerated by a pet kitten is not accepted with equal resignation by all cats; or that aggressive and noisy selfishness tolerated in some homes is not so successful a technique in the classroom. Superstition is a similar and equally childish form of inductive reasoning, because it is based on the assumption that, if an occurrence has been accompanied by some coincidental event on some occasions, the recurrence of the event must be accompanied by the coincidental event on all occasions. Because tragedy followed the sitting of thirteen at the table at the time of the Last Supper, the number has remained "unlucky" for nearly two thousand years.

Before an induction can be accepted as a reasonable hypothesis it must at least be shown that it is true of all known cases. Then the process is a valuable one. Scientific research and philosophic speculation, which stretch to an ever-widening knowledge, do so very largely by this process of inductive reasoning. The process is assumed, often unconsciously, in the classroom to a much greater extent than may be supposed. In demonstration, such as in nature

study, what is observed of specimens exhibited has to be assumed as true of the species. Each child of a class may measure the circumference of one of forty differently sized circular discs, divide this measurement by that of the diameter, and discover that all the quotients, if accurately calculated, are identical. But the class will still have to accept from the teacher the generalization that what they have discovered of forty circles is true of all circles. Even "two

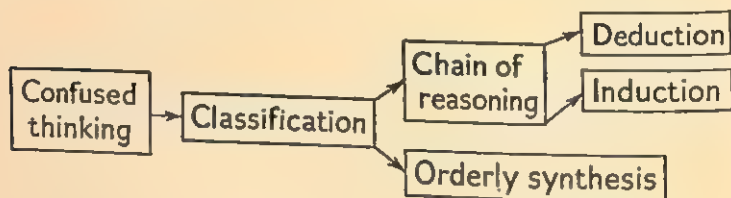


Fig. 8

and two are four" is a generalization as distinct from the specifically demonstrable truth that "two apples and two apples are four apples." All creative and imaginative processes are of this class, for they lead to the production of something new, some new pattern, design, idea or hypothesis not deducible from the data.

So far we have tried to show how various forms of thinking may be related as stages in an evolving mental process. In the first stage the mind wanders round the topic, gathering associated and relevant material. The second is a process of classification and clarification. The third stage may be one of interrelating these classified items into an orderly whole or some newly conceived synthesis, or one of interrelating them as a chain of reasoning, leading to some deduced conclusion or some induced generalization.

As stated in the opening paragraph, this descriptive analysis of the processes of thinking is a deliberate simpli-

fication, but one which, in the writer's view, covers with one exception all classroom needs. The exception, which is the important relation between thinking and speaking, is discussed separately in a later chapter. Before we return to the classroom five general points may be restated. First, all these processes are revealed in an elementary form in infant behaviour. Secondly, any process needs time. The reason for restating this self-evident truth is that some of its implications are less obvious. To sit and think for any length of time is so rare an occupation as almost to appear an eccentricity. As it involves the attempt to exclude all environmental factors it is an unsociable use of time, and the opportunities for its exercise are rare. For the average person life tends to fall into so mechanized a routine that a rational and considered approach even to its essential problems seems to stir the more intelligent adolescent and then to be abandoned. In the classroom, where some visible evidence of what is happening is necessary, and where training implies direction and guidance, thinking has usually to find expression in some audible or visible experience.

Thirdly, most forms of thinking are pleasure-giving if there is a reasonable chance of their achieving some measure of success. A problem that is hopelessly baffling, or which demands knowledge which one does not possess and cannot discover, is worrying, as is all prolonged frustration. That the process which promises success, rather than the resultant product, is a source of pleasure is evident from the popularity of puzzles, which cease to have any value or interest when solved.

Fourthly, the essential factor in training is, yet again, consistent, regular, and frequent practice. One does not learn to think clearly and to reach valid conclusions merely by taking a course of logic, any more than a course in grammar and syntax is a sufficient training in the use of language. The

function of these disciplines is corrective and explanatory. One learns to think by thinking, as one learns to talk by talking. No one would question such a statement as "One learns to skate by skating", yet in many fields of learning, as in music for example, there is still a deplorable over-emphasis on a theoretical and academic approach often quite unrelated to its practical significance.

Lastly, orderly and purposeful thinking has something of the essential quality of an art, in that it aims at the creation of order out of chaos. The jumbled items achieve a patterned unity as the stones and timber become a cathedral; the scattered thoughts become a composition, whether it is a child's essay or an immortal lyric; the baffling data merge into meaningful solution, whether the problem is of simple arithmetic or nuclear physics.

In the following pages we propose to relate the ideas outlined in this chapter to classroom practice.

CHAPTER XI

ORDER OUT OF CHAOS

THE process of putting one's thoughts in order cannot be taught as a specific skill, craft, or "subject" can be taught. Yet it is a process that responds to training, and there is considerable evidence that it needs much more training, or more effective training, than it receives. Anyone who has marked examination papers, or essays, or who has glanced through students' lecture notes, or listened to adult discussion, must have observed the general inability to select, classify, and arrange material efficiently, even when those concerned are of more than average mental capacity. The immediate problem is to discover what, if anything, can be done in the average classroom to develop this capacity more efficiently.

What would have to be trained is obviously a general mental process which is applicable to any classifiable data; but if this were all such training involved there would be no problem. All that would be necessary, within the limits of individual innate capacity, would be to make the child aware of and interested in the process, conscious of its significance, and to provide opportunities to practise it as often as possible. Before suggesting how this part of the training might be carried out more extensively in the classroom, we have to recognize that there are other psychological factors which influence the process and which, therefore, have to be included in the training.

Let us suppose that someone has to give an important lecture or a difficult lesson, or to write a paper. The first stage in the preparation would probably be that of collecting

the necessary information, of checking facts or references, and of thinking in general terms round the topic. The next stage, that with which we are concerned, would involve the orderly arrangement of this material into a coherent unity, and it is possible that this stage might present some difficulty; it would certainly take time and involve effort. It is clear that at this stage the quality of the work will depend not only on the mental capacity and relevant knowledge of the person concerned. How much effort will he be prepared to put into the process? Will he be satisfied with the first draft? If not, will he be willing to reject repeated attempts until he is entirely satisfied that he can make no further improvement? How will he react to repeated failure and frustration? Does he care sufficiently about the quality of the final achievement to make the perfecting of this the determining factor? All this may be summarized in a single question: how far has the person concerned formed the habit of carrying out a task to the best of his ability?

There are several reasons why this general question, which is applicable to any kind of task, should be related more especially to the two ideas involved in the process we are discussing, that of orderliness and that of planning. The connection is probably clearest in the world of art, in which the painter, musician, poet, or sculptor endeavours to bring "rude matter into due form", to achieve the perfect design, a unity of which every part is in harmonious relation with the rest. To achieve perfection is to make the perfect design, and to design is to plan. To plan is the mental process which involves the purposive ordering of relevant knowledge and ideas, the process with which we are immediately concerned. Thus, training in mental orderliness involves a training in thoroughness, in the acceptance of standards of goodness, in the rejection of the slipshod and the muddled. It involves training in the overcoming of resistances, of over-

coming weak and lazy tendencies before they become habitual.

The significance of this to the teacher is that, (1) whereas efficient thinking is limited in its development by the quality of a child's innate capacity, one of the relevant factors in its development is insistence on thoroughness; and (2) however poor may be the mental capacity of a particular child, this provides no justification for the presentation of slovenly, careless work. The most inefficient can at least make a sincere effort. One aspect of the training process, therefore, is that of developing habits of orderliness; such training implies insistence on carefully planned work, on its orderly arrangement when presented, and consistency in accustoming the child to the idea that work which could have been done better will inevitably have to be done again. This kind of training can be applied to every child, whatever its mental capacity, for it applies to effort rather than to achievement. The other aspect of the training is more specific, and it is to this that we now have to turn.

In the infants' school probably the most important aspect of a child's learning is the development of simple concepts. First the child notices something, then notices it again, and gradually learns to recognize it. If the experience becomes associated with a word, so that the recurrence of the experience recalls the word and the word recalls the experience, the child is said to have "formed a concept". This is not simply a matter of increasing the child's vocabulary, but of learning something through experience and of knowing it well enough to give it a name. Let us suppose that a young child, while experimenting with materials in this way, has learned the meaning of "heavier than", and that the child, presented with new materials, says correctly that "this is heavier than that" a sufficient number of times to establish that the child really knows what the expression means.

This kind of knowledge is well in advance of object-naming, for it involves the making of a comparative judgment, the eduction of a relation. Simple comparisons have to be drawn in elementary classification, and simple "games" which involve this process can provide graduated practice in it. A number of objects can be arranged in heaps according to colour, size, shape, or any other perceivable attribute.

All this is, of course, already being done, but the experience becomes much more valuable if it is used as part of a purposive course of training. The experience could be used, for example, to create for the class a concept of orderliness, just as water play and sand play are used to develop many relative concepts. A word or phrase would be necessary, such as "putting in order", and the idea, once formed, could be applied to other activities. Materials and equipment could be put away in order; the classroom could be "put in order"; the group movements of rhythmic play could be shown to be orderly movements; the constructed model could be shown to result from putting the pieces together in order. Such experiences become still more valuable if the child is helped at the same time gradually to appreciate the significance of orderliness, to associate the idea with "doing something well", and to dislike confusion, which, incidentally, many children dislike naturally.

Because thinking is closely related to the use of language it is relevant to this particular training that children should be given opportunities to describe experiences, or to retell stories, and that, before they do so, the main items should be recapitulated "in order". This suggests to the class that thoughts can be put in order just as can a box of bricks.

The principles inherent in these suggestions can be applied in suitable ways to all age-groups. With older children the most useful medium for their application is written work, for time can be allocated to the arranging of the material, and the

work as presented provides reasonably reliable evidence of the amount of effort that has been given to it. Descriptions of lessons, experiences of events, and even of objects provide useful practice, provided that no written statement is accepted which does not reveal that the stage between the assembling of ideas and the written exercise, the stage we are endeavouring to make habitual, has been included. Nature study, geography, social studies, and similar areas of school work provide opportunities for practice in the classification of points developed or illustrated in a lesson. Project work and other forms of group work derive their greatest value from the final assembling of the separately contributed items, for often the training in the way knowledge may be organized or expressed is of far more lasting significance than the knowledge itself.

A further suggestion, which the reader may like to try with a few of the more intelligent members of a class of, say, ten-year-old children and upwards, is this. Let them write a short description of anything they wish, in as perfect a form as possible, rewriting and polishing it until they can improve it no further. They could be given various standards of judgment, such as the value of simplicity and conciseness, the need to avoid unnecessary words, the desirability of varying the lengths of sentences by introducing adjectival and other clauses, the use of varied punctuation, and the like. The children selected should be such as would derive pleasure from the effort to produce a perfected example of writing, and who would not mind the necessity of rewriting it. The more children who can be trained to adopt this kind of attitude the better, but the exercise as suggested is restricted to a few outstanding members of a class because it implies already a higher standard in the use of language than would be likely to characterize a whole class of non-selected children, and the exercise is time-absorbing.

The exercise just suggested reveals the close similarity between the process discussed in this chapter and what is usually called "creative work". Much of the recent writing which advocates more "self-expression" and more "creativity" in school work fails adequately to distinguish these processes from craftsmanship, and tends to reflect the surrealist principle that the spontaneous expression, the inspired thought, should be left as it comes, hot from the Unconscious. While emotionally inspired improvisation is accepted as an essential quality of jazz, the creators of the world's masterpieces in every medium have consistently distinguished between the first imaginative idea and the subsequent effort involved in expressing this as perfectly as possible as a *work* of art.¹ With long experience the highly skilled craftsman may write, draw, paint, or carve with a fluent ease that little subsequent alteration could improve, but the school-child is only beginning to learn how to express its ideas in one medium or another. It is obviously desirable that it should be, as far as possible, the child's own ideas and imaginative thoughts that it should be expressing; but what is expressed and how it is expressed are inseparable though distinguishable aspects of every human utterance, from a sentence to a symphony. The teacher has not to choose between the encouragement of illiterate self-expression and that of polished transcription; he has to choose between the toleration of the slovenly products of lazy indifference and those which reveal at least a genuine effort to produce something worth while.

All that has been said of planning and similar examples of bringing mental confusion into orderly unity is applicable to the processes of reasoning, which differ only in that the items are so related as to lead to a conclusion rather than to a synthesis. The items fit together not as do the pieces of a

¹ See particularly Dr. Harding's *Anatomy of Inspiration*.

jig-saw but as do the links of a chain. As was suggested earlier, there are many opportunities in the classroom for the development of the child's reasoning capacity, particularly in deduction. The essential point is that the class shall make the deductions, if necessary with help, not the teacher. In a course of theoretical geometry, which is an elaborate structure of deductive reasoning, the reasoning has merely to be followed except when riders are being attempted. Consequently, many older children who could write out correctly theorems learned, do not necessarily reveal any consequent improvement in their general deductive reasoning. In many lessons in which the class could be led to a conclusion, the opportunity is lost by a teacher who gives the class the deducible information. Not only is the chance of practice in thinking lost, but the information is less likely to be remembered, and is often far less interesting than would have been the process of deducing it. The writer recalls a most imaginative lesson on the monsoons; it was given by a young teacher who began by asking the class why the ceiling in the classroom was dirtiest over the radiators!

Most problems which a class is called upon to solve, usually in arithmetic, involve deductive reasoning, unless the class has learned to solve them mechanically, when they cease to be problems. In the most effective use of such problems the class is helped to make the deductions on which a solution depends, and taught to write down the necessary steps in order, until the way to tackle a problem is known. More obviously in this than in any example previously quoted, it is the process and not the "answer" which is significant; for when a problem has been solved, a jig-saw assembled, a crossword puzzle completed, interest in them has been exhausted. It is easy to forget this truth in the classroom, and to give the class the impression that the correct answer is all that matters. The teacher who helps those whose

answers are wrong to discover why they are wrong, and who does not handicap the slower but conscientious child by being unduly concerned with how many the class can do correctly in a given time, does much to correct this impression. If he also encourages genuine effort and consistently rejects the slipshod, such a teacher would be invaluable in any classroom.

CHAPTER XII

THINKING AND SPEAKING

It is curious that, except in ancient times, so little attention has been given in schools to speech training, in its widest sense of a training in oral expression. It is all the more curious in that so much of the normal school curriculum has been decided on utilitarian grounds, and it is difficult to imagine any more generally useful capacity than that of intelligible utterance. The common argument that most people manage sufficiently well with the degree of verbal efficiency they naturally acquire could be used far more convincingly to exclude a considerable part of school learning which is usually regarded as essential. Equally absurd is the fairly common view that it is "a pity" to attempt in schools to substitute an artificial standard English for the "natural" local dialect which the child learns at home. The value of a standard dialect is that it provides a common medium for national instead of local communication; it is also the language which the child is taught to read and to write. Many local dialects are so different from others that even to cross a shire frontier is sometimes akin to entering a foreign country. For example:

| <i>Standard colloquial</i> | <i>East Shropshire</i> | <i>South-west Staffordshire</i> |
|----------------------------|------------------------|-------------------------------------|
| I shan't | I shanna | I shor |
| You won't | Thee wutna | Yō wō |
| You are | Thee bist | Yo bin |

It is not a matter of mere indifference to pronunciation,

as to whether "castle" should be pronounced with a long or short "a", but also one of differences in vocabulary and sentence structure.

Neither is it psychologically sound to assume that, if a child is taught to write in accordance with the principles of a standard national language, this training will necessarily be transferred to his speech. Learning to talk is very largely a process of habit-formation, and if a child speaks one language and writes another he will merely continue to do so, as so many children do when they leave school.

There are, however, other reasons than these for the extension of speech training in schools, for, as will already be apparent from the preceding chapters, language has other roles in learning than that of communication. Some words and word-groups help to fix concepts; associations between words and experiences are an important factor in remembering; imaged speech is another valuable aid to recall. Even more significant is the relation between thinking and language. One psychological doctrine, that of the Behaviourists, maintains that thinking consists essentially in talking to oneself; on the contrary, the late Professor Spearman used to say that one could think without using words. In the form that they are stated these are contradictory propositions; but the contradiction disappears if we recognize that thinking can function in other media than language, and if we extend the idea of "speaking to oneself" to include other forms of imagery. It is possible, for example, to "think in music", as the composer does; but the composer either hears mentally the sounds his writing represents, or sings the imagined melody to himself, or feels the imagined harmony in his fingers. If he is genuinely thinking in music, and not producing something mechanically, this thinking must express itself either in some audible utterance, vocal or instrumental, as in keyboard improvisation, or in imagery,

which may be auditory or kinesthetic or both. Ordinary thinking is concerned with things and events and ideas in some form of interrelationship, and, while introspective evidence reveals that we do normally "think in words", it is inconceivable that it should be otherwise, except for the rare situations which demand correlated forms of imagery. One reason for this is that thinking goes beyond the limits of perceptual experience; one may perceive things in relation, but the relationship itself is something of which we can think, which we can name, but which is not itself perceivable. We can, for example, think about "Time", and even about "Eternity", and books have been written expressing some of the complex ideas which have been thought about them; but "Time" itself is only an idea, a relative degree of duration, of "beforeness" or "afterness". It is not easy, but it is possible to think of events in temporal relationship without using any words; but it is impossible to carry out a thinking process with "Time" as the topic without the use of words because there is, in such a process, no other medium in which the thinking process can function. Language has had to provide generalizations, conditional clauses, abstract names, expressions of possibilities, and many such refinements, in order to meet the demands of thinking processes which transcend that knowledge which is limited to sensory perception.

The significance of this is the great measure of interdependence between thinking and spoken language. A jotted note or a final script may express the result of thinking, but writing is slower than speech and slower than thought. One reason why so many intelligent people write badly is that the impatient attempt to make their writing keep pace with their thoughts has developed a habit of scribbling. When the older and more intelligent members of a class begin to develop this tendency, as distinct from careless writing

through laziness, regular insistence on a well-written "fair copy" serves the additional purpose of bringing the thought process to orderly completion. It is, therefore, the spoken language which, subvocalized or mentally spoken, forms the main vehicle for thinking.

Several points of importance to the teacher emerge from this generalization. The first is that a child's and an adult's capacity for thinking is limited not only by innate factors but by the degree of acquired efficiency in the use of language. It is not that the thought and its subvocalization are, as the extreme Behaviourists might urge, one and the same thing; it is that a thought which cannot be put into words seems to struggle in vain and helpless confusion to become articulate, and is stifled. The second point is that every child, however intelligent, can acquire efficiency in the simple, concise, orderly, and thoughtful use of spoken language only by guided experience. Because the quality of speech not only reveals but controls the quality of thinking, practice in clearcut expression, in accurate description, in simple deduction, is necessary if the child is to be trained to think clearly.

The purpose of this rather lengthy exposition is to emphasize the value of a training in speech. This is not to produce orators or to develop glibness, but to train the class to think sensibly and clearly by providing opportunities for it to think aloud. In organizing such experiences it is necessary to distinguish between those which are part of a planned, directed, and graduated course of learning the spoken language, and those which merely involve speech or which use speech for what is popularly called "self-expression", as in improvised drama. These experiences overlap, of course, but they are distinct.

It is not easy to provide such experiences in the classroom. A whole class can write at the same time, but only one

member of a class can be allowed to speak at once. Group discussions do not provide a satisfactory solution, for the more completely each group is isolated the more difficult is helpful supervision. Moreover, when one member of a class is speaking, the rest of the class has to be brought into the proceedings in an interested and active way, and listening alone is unlikely to do this, particularly if prolonged. Many teachers have already solved these problems in various ways, but a few suggestions may be helpful.

For gaining experience in the use of the standard dialect the reading of plays aloud is helpful, if they are well chosen. They should be short, so that more children may have "parts". Poetic drama and plays in archaic language are useless for this purpose, which requires simple, good, contemporary dialogue. Housman's "Little Plays of St. Francis" may be suggested.

Another useful procedure, which involves thinking and provides opportunities for correction, is that of asking the class for a careful description of something familiar. One method of retaining the interest of the whole class is to pass the name of an object to a member, and to ask her or him to describe it; the others have to discover the object from the description. The class then, under guidance, tries to improve the description before the process is repeated with another subject. Older children can be given valuable practice in defining familiar terms, a much more difficult process than that of describing familiar things, but a most useful exercise in helping to clarify knowledge empirically gained.

Group leaders can be given the opportunity of telling the class what their groups have accomplished. One useful device, which combines training in clear thinking with training in summarizing in speech the result of the process, is to give to a group a number of similar but differentiable items,

such as pictures of different kinds of trees, costumes, houses, or different kinds of material, such as fabrics or pieces of wood. Each should be named, and the group has to distinguish and classify the differences, which afterwards have to be described to the class.

The imaginative teacher will think of many other ways in which this kind of training can be given. One important factor in all these procedures is that familiarity with the use of a word or phrase is more influential than are grammatical principles. When speaking, one is necessarily concerned more with the content than with the form of the expression, which has to become habitual. Frequency in the use of the expression is, therefore, the most influential single factor.

A special comment may be made about classroom debates, with which the writer experimented with classes of eleven-year-old children and upwards over a period of twelve years. The following conclusions are based on this experience and on observations of class debates in other schools. For brevity and convenience they are summarized.

(1) Organized debates, under an elected chairman and secretary were more successful and useful than any form of "free discussion".

(2) It was invariable that the eleven and twelve age-groups showed the greatest interest in debates and the most rapid progress in speech and argument. The procedure was less successful with the young adolescents of thirteen and fourteen years of age, especially if they had not had earlier experience. There was more self-consciousness, and individual differences in knowledge and specific capacities and interests were more marked. There was an increasing tendency for some speakers to monopolize the discussion, and for others to be content that they should. With still older groups the debates regained their value. There was an increasing willingness to discuss more abstract topics, particularly

when a tradition of complete "freedom of speech" had been established.

(3) In any age-group the most successful debates were those which the class already had in mind when acquiring the necessary information. If, for example, a class was reading a story or a chapter about the Civil War of Charles I's reign, and knew that this was to be followed shortly by a debate on whether the class would have joined the Cavaliers or the Roundheads, not only did the reading gain in interest, but also the debate would have more body in it. The opening speeches developed best when permission was given to the speakers to refer to a list of written "headings", but it was necessary to insist that no speech should be read.

(4) In the most effective classroom debates the teacher has to be content to sit as an ordinary member of the class society, tactfully catching the chairman's eye when it is necessary to intervene, in order to correct an error which some other member has not corrected, or to prevent some members from speaking too much and others from not speaking at all. Should the debate begin to lose the interest of the class, or reveal inadequate preparation, the teacher can, of course, call upon the chairman to take the vote and close the debate, so that the class may proceed to some more profitable occupation.

(5) Such debates form a useful change from other class activities if not held too frequently, but they must be held frequently enough to establish the idea of a class society and the procedure of debate. Such a society can serve many desirable purposes, but as training in accurate speech, in clear thinking, or in argument, the value of classroom debates can easily be over-rated. In debates and discussion, as in such activities as improvised drama, the relating of an experience, or the telling of a story, the interest is necessarily directed mainly to the content of what is being said. Correc-

tion of speech would involve an intrusion into the thought almost to the extent of being an irrelevant interruption. It would distract the speaker's attention from his speech, and probably halt him completely. The correction of written errors takes place after the event, which, therefore, is unaffected. When the interest is in the *form* of the speech, as in exercises in description or definition, correction is expected.

A considerable extension of this more specific kind of training in the accurate expression of careful thought could not help but improve in time the quality of all classroom experience. Education is not a process either of pouring information into a child as into a vessel, or of hammering it into a resistant "mind". However one may define its aims or formulate methods for achieving them, education can do no more than help a child to develop what potential capacities it has and help it to learn how to use these developed capacities to the best advantage of itself and of others. As the ability to talk sensibly and the ability to think clearly are two of the most important group of peculiarly human capacities, and as they are to a large degree interdependent, no system of general education can be complete which does not attempt their efficient development.

PART FOUR

FEELING

CHAPTER XIII

THE NATURE AND SIGNIFICANCE OF FEELING

It is helpful for a teacher to be familiar with the nature of emotion and with some of the complex and seemingly inconsistent effects which "feeling" and emotion have on the processes of learning. To two particular aspects of classroom experience which are especially affected by these factors the succeeding chapters of this book are given; but first it is necessary to consider them more generally. The word "feeling" has been used in so many different ways, both in common speech and by psychologists, that the difficulty of giving an acceptable definition to the word provides a further illustration of the principle often stated in this book that we do not normally learn by definitions. If a person says that he feels friendly or hostile towards another person, or that he feels bored by something or enthusiastic about it, or that he feels thrilled, or frightened, or angry because of something, his meaning is intelligible to us. We know how he feels, or we know how we feel when we use these expressions, and we assume that his feeling is similar to our own. We can, however, go further than this.

Consider the three statements: (1) There is a storm; (2) I feel frightened by the storm; and (3) I feel thrilled by

the storm. The first statement expresses simply an awareness, a perception of some external event which has attracted sufficient attention for it to have been observed; but on the evidence of the statement there is no reason to believe that anything other than the mere perception of the storm has occurred. The perceiver may be quite indifferent to the experience, and may turn immediately to something more immediately interesting to him. In the second and third statements it is revealed that the interest of the observer is directed to his own state, to the subjective response evoked by the storm. A personal, intimate, and significant relationship has been established between something perceived and the person who has perceived it. In the second example the quality of this link, the reaction of fear, is an undesirable one, in that it is opposed to the continuance of the experience. In general it leads to attempts to escape from or, if possible, to resist the recurrence of such experiences. The person who made the third statement, however, would wish the experience to continue and to recur; he would wish to extract the utmost from the experience, and not to be diverted from it. Clearly, any classroom experience which succeeds in inducing in a child this feeling of enthusiastic, absorbed, and delighted interest, will capture the greatest possible effort and attention from the child. Such an experience passes beyond mere perception; it brings the child wholly into the experience as it is something the child has lived.

This kind of "feeling" exists also between persons, and is, therefore, an influential factor in child-teacher and child-class relationships, in the development of loyalties and friendly co-operative effort, and all such desirable aspects of successful social training. Unfortunately, while indifference or lack of feeling will bring about no such desirable conditions either of interested and co-operative effort or of personal relationships, an undesirable feeling

such as that of fear, antagonism, or resentment, or dislike, will neutralize effort and destroy classroom unity. All feelings and emotions pass through a range of quantitative variation from, say, pleasure to displeasure, liking to disliking, loving to hating, with indifference lying halfway between. They resemble the curve of a graph which passes from the positive side through zero and continues symmetrically on the negative side. We may state, therefore, as a first general principle, that *those classroom experiences and relationships which induce a pleasure-giving emotional response in a child are likely to be, for that child, the most significant of its classroom experiences.* To them the child will give its most willing and its undivided attention, they may lead, at least for a time, to the formation of "interests" and friendships.

It is necessary to make a number of qualifications to this general statement. First, it does not follow from it that a child should be expected to do only what "it feels like doing". One's natural likes and dislikes, one's preferences, even one's enthusiasms, are not stable and fixed. They are modifiable with experience. One may tire of the over-familiar, or discover new sources of interest as an experience becomes more familiar. Moreover, a great part of education, particularly of social education, consists in the modification of natural tendencies, the teaching of new standards, the appreciation of new values. In the early stages of most branches of learning there is likely to be much that may be found burdensome and difficult; but if its purpose is understood and its achievement sufficiently desired, resistance to the effort demanded is at least likely to be reduced if not always overcome.

The general principle stated, stressing the value of those classroom experiences which induce a pleasurable emotional response from the class or any members of it, has to be qualified in a second way. It is characteristic of all emotional

states that they are capable of developing into a condition of excitement in which self-control and rational behaviour tend increasingly to be replaced by irresponsible action. There is a marginal borderline beyond which laughter merges into hysteria, fun and games may lead to wild disorder, resentment may turn to anger, and fear to terror. These aspects of emotion and their importance in the classroom are discussed in a later chapter (pages 105-7). It is sufficient to say now that the value of an emotional response of the right kind is not vetoed in the classroom by the fact that such emotions become destructive influences when uncontrolled.

The stimulation of a feeling of pleasurable interest in a class depends essentially on the teacher's own feeling. A class reflects as surely as a mirror a teacher's genuine concern for its members and for their work and their welfare. A teacher's own interests and enthusiasms tend to awaken similar interests in a class. Encouragement can help to recapture flagging interests when tasks seem difficult or are becoming dull, and successful achievement and its recognition provide the feeling of satisfaction which helps to induce further effort.

German psychology has a word, "Einfühlung", which means "feeling into", a word for which the British psychologist Titchener invented a translation "empathy". As "sympathy" means a "sharing of someone's feelings", so "empathy" means the projection of one's feeling into something. Anything we may do, from a school-child's exercise to the creation of some masterpiece, becomes so much more significant to us if "we have felt ourselves into it", as an actor feels himself into the part he plays. The teacher has to 'feel himself into' the class he is teaching, as does the child into what he is doing. It is to one particular form of classroom experience, which provides special opportunities for the expression of a child's feeling, that we now turn.

CHAPTER XIV

IMAGINATION AND CREATIVENESS

ONE of the major changes in school education during the last half-century is the greater significance given to such ideas as "creativity" and "self-expression", especially in the teaching of the arts. In these fields of school experience, however, teachers hold widely divergent views, and the vast variety of theories which philosophers, psychologists, and aestheticians have propounded on the nature of the arts is likely to be found more confusing than helpful. Four of such general theories are of special and practical value to a teacher:

(1) *A work of art is something created*, an original product of the imagination;

(2) The subjective theory, developed for example by Croce, Gentile, and Carritt, that *art is the expression of feeling*;

(3) The objective theory, which preceded the above but has more recently regained favour, that *a work of art is essentially a design, a formal unity of harmoniously inter-related parts*;

(4) The view held, for example, by the poet, painter, and writer, William Morris in the nineteenth century, that *art is simply a matter of craftsmanship*.

These views are not mutually exclusive and, indeed, are interrelated; but much teaching practice is based on the over-emphasis of one or other of them, to the virtual exclusion of the rest. They all, however, have an important bearing on classroom procedure, and a brief discussion of each in turn, in relation to the classroom, may be helpful.

First, the view that stresses the importance of the imaginative and creative quality of the arts has been foreshadowed in these pages, when we compared certain processes of thinking with the production of a work of art. Both kinds of process, if successful, lead to the emergence of order from a confusion of unrelated items. The distinction lies in that the peculiar and characteristic quality of a work of art is its personal genesis, its uniqueness. Its constituent items have been brought into a new relationship, or interrelated to produce some new synthesis. From the confusion of colours on his palette the painter creates a new picture; from the infinite variety of unrelated sounds the composer evolves a new composition; the stones and timber may become an architectural masterpiece; the child's box of bricks may become a "castle". The resultant product cannot be judged as correct or incorrect, as can the assembly of a jig-saw puzzle or the solution of a problem; it is something personal and individual, the product of a creative imagination.

Readers who have taught in or even visited Infants' Schools will have no doubt as to the imaginative capacity of most young children, of their love of fantasy and make-believe, of their easy readiness to think of a box as a ship, of a table as a dungeon, a cave or a castle. Young children, too, delight in making something, and find pleasure in colour, in rhythmic movement, in pattern, or in rhythmic music. These three qualities, the imaginative, the "joy in the making", and delight in colour, in rhyme and rhythm, form at least one group of aptitudes for many worth-while school experiences, some of which may lead to the development of enduring interests.

That these qualities should tend to become gradually less influential as children grow older is not altogether the fault of the schools. Children become more self-conscious,

aware that they are "growing up", and that life is not a continuous play-time. They learn, too, usually far too soon, that adults seem to value things and activities only for their usefulness, and tend to regard as a waste of time such pleasure-giving pursuits as model-making, drawing, painting, dancing, singing, playing percussion-instruments or recorders, or making up stories or verse. Unfortunately there are still some schools in which this deplorable pragmatization is at least not discouraged, and there still are intelligent children who leave school prepared to make a living but with no knowledge of how to live, bored with leisure, insensitive to beauty, and no longer stirred by the joys of adventurous and creative effort.

The second theory, that art is an expression of feeling, is the one which, probably, exerts most influence on modern teaching practice. The "feeling" relationship discussed in the previous chapter is nowhere so strong as that which exists between a child and that which it has "made itself" or between an artist and his creation. In no other experience is there such a complete and joyous absorption of interest as in the process of self-expression through some form of creative activity. In child-art, the significance of any effort produced lies only in the extent to which it genuinely expresses and symbolizes what the child has felt when producing it.

Because it is easy to fall into the error of thinking in extremes, it is possible for a teacher to exaggerate this view, and to forget that to express anything in any medium involves skills which have to be learned. It is very important that a child should have the opportunity of expressing what it feels, and that what it does express should be what it feels. But it is also important that a child should be helped to learn how to express what it feels, lest "the dumb Keats within us" should remain for ever dumb.

The third view of the arts, that their essential qualities include that of being designed and formal unities, can be deduced from the preceding theories. If art is to be something created, something felt, a personal expression, it can never be something merely copied from anything else, even from Nature. There is nothing that is a personal expression, there is no necessary quality of feeling, in the act of transcription, or translation, or direct representation. Even in landscape painting whether from natural or from imagined scenes, the items have to be "composed" into some harmonious unity, to express the particular feeling or idea of the painter. Art may be the expression of feeling, but it is a disciplined expression, a designed expression.

The significance of formal design is accepted, and is indeed obvious, in all the arts other than the visual ones. Music, from a single bar to a whole composition, is a hierarchy of related sounds; its significance, like the beauty of architecture, is an intrinsic quality, the satisfying harmony of its design. Poetry differs from prose in its subjection of the ideas expressed to some formal pattern, which may be as simple as the antiphonal symmetry of the psalms or as complex as a metrical and rhymed epic. But paintings have varied from the mere representation of things produced by skilled or less skilled copyists to mere patterning. Great paintings and great sculpture, in common with all forms of art, express what an artist feels, and what he feels it possible to express only through the medium of the formalized pattern of his art. These two attributes of art have to be welded from the beginning, the attribute that what is attempted should be an imaginative, personal expression of something felt and felt to be worthy of expression, and the attribute that such expression should be given the added interest of being composed as a harmonious unity.

The following incident illustrates the value of this idea

in the classroom. A Secondary-School Headmistress invited the writer to an exhibition of paintings done by different age-groups in the school. Afterwards, in her study, she said "Most of these paintings are imaginative, many are full of life and movement, the colours are well chosen in most of

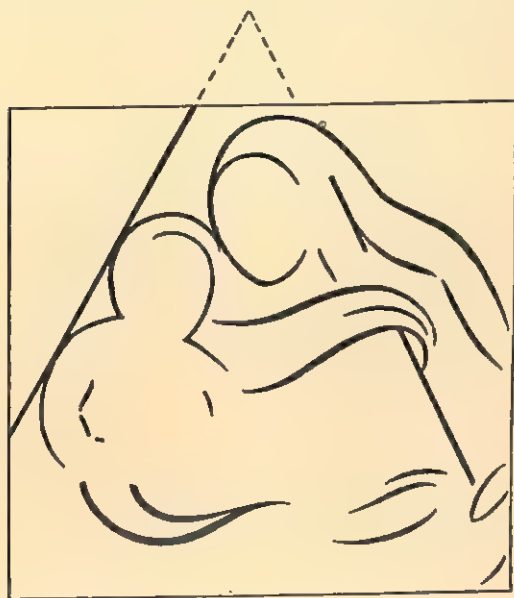


Fig. 9

them, the general techniques of drawing and painting are adequate, the pictures are entirely the children's own work. But I feel that something is missing, and that there is very little real progression from one age-group to another. What is wrong?" On the wall of the study was a reproduction of Raphael's "Mother and Child". It provided a useful illustration, in its triangularity and balanced curves, of the

rhythmic and patterned form which the artist had imposed on his subject. The great painting was not only a beautiful conception of the Madonna and Child; like a poem it was also a rhythmic composition.

The idea, new to the Headmistress, provided a new interest and stimulus to the children's paintings, which, however imaginative some of them may have been, conveyed no conception of design. In most schools the children invent abstract patterns, that is, patterns with no representational or symbolic significance; they also make representational or illustrative pictures. The new interest aroused by combining both these forms of expression leads to a new conception and appreciation of painting.

The fourth approach stresses the significance of craftsmanship in all forms of artistic expression. Every craftsman is not necessarily an artist, if we accept as essential characteristics of art the qualities we have been discussing, for a craftsman may be a mere copyist, expressing nothing of his own feeling, or of his own imagination. But every artist must be a craftsman, and every great artist must be a great craftsman. Intelligence and imagination are innate capacities which classroom experience can do no more than develop; but craftsmanship has to be learned. No teacher would question the necessity of helping a child to learn how to express itself in speech and in writing, or to acquire the skills and knowledge involved in musicianship. Yet many are hesitant as to how, or even as to whether, to help a child to learn the crafts of painting and drawing.

Most teachers are probably familiar with the work of Franz Cizek, and of its revolutionary influence on the conception of "child art" and its development in schools. It was certainly never the practice of Cizek that children should be left to draw or paint without help from the teacher. In Dr. Viola's book *Child Art*, in which Cizek's work is

described and discussed, there is a chapter which gives a verbatim account of many of Cizek's lessons, and a few quotations from this will, perhaps, best illustrate the kind of help which this great teacher used to give.

First he would give his class what may be described as an imaginative stimulus, helping the children to build up a mental picture.

"The first group will make the following picture: in the background there will be mountains and on their slopes little houses. The sun will be in the sky, and it will shine warmly on those little houses. The sun will shine as beautifully as to-day. At the foot of the mountains are little gardens. They are neatly fenced, so that the flowers don't spread into other gardens. In these gardens there may be too little houses and fountains. There we shall draw men working. And little dogs running about. Goats are bleating. Sheep are grazing. Hens are cackling. You can draw all that." ⁽¹⁾

As the musician has to learn to think in sounds, so the painter has to learn to think "in pictures", and Cizek was helping the children of his class to imagine such a picture as he was describing. His description did no more than tumble out suggestions which each child would be left to compose in its own way. There was nothing to copy.

The second kind of help which children need, and which Cizek unhesitatingly gave, is that of critical and constructive guidance. The artist has to learn to be self-critical, and the child-artist has to be helped to discover what has been done badly.

"Now here is our Trude. Look at what she has done! It is as if she has put her fingers into the paints. Her picture lacks form. She only fills the paper with splashes. No, Trude, you can do much better." ⁽²⁾

⁽¹⁾ Viola: *Child Art*, University of London Press Ltd., p. 158.

⁽²⁾ *Ibid.* p. 150.

Thirdly, the children should, of course, be encouraged to produce any synthesis their imagination may invent:

"An artist produces what he has the divine right to produce. If she has started with one leg, and added a second, she has the right to do a third or fourth, because it gives her artistic pleasure." ⁽¹⁾

But there is a difference between deliberate distortion and inaccurate observation. As we have often observed, perception is normally of "wholes" and is not analytic. The distortions in a child's drawing, when not produced deliberately for "artistic pleasure", may reveal what the child feels about what it is drawing, or what it considers important about it; but they also may reveal that something a child wishes to draw or paint has been only vaguely observed, that its relevant craftsmanship and knowledge are so inadequate that the child simply cannot draw what it wants to draw. It is as important that a child should be given help and guidance in this field as it is in any other form of communication, linguistic or artistic. That Cizek, who accepted as much deliberate distortion as a child wished to introduce into a picture, did not hesitate to criticize other forms of distortion and to help his class to observe more analytically, is shown by the following extract:

"There are no zig-zag trees. Trees consist of a trunk, branches, and twigs. . . . Zig-zag trees grow in schools, but they are severely forbidden here. Here we must think: What does a tree look like? . . . We do trees which we have experienced ourselves, under which we have walked, where squirrels frisk about". ⁽²⁾

While such a method of teaching, therefore, helps to develop what imaginative capacity a child may possess, and

⁽¹⁾ *Ibid.* p 154.

⁽²⁾ *Ibid.* p 162.

to encourage originality and "creativity", it also helps to develop a critical attitude to what is being created, and gives considerable if indirect help in the development of the relevant craftsmanship.

A creative approach to the development of musicianship presents obvious difficulties. Individual music-making in a class is impracticable, and the writing of music involves already a fairly advanced musical knowledge and capacity. Yet there are possibilities at all stages. Improvised dancing, both of the interpretative and merely rhythmic varieties, have their value at the infant stage, and possibly at later stages. So too has controlled but improvised percussion playing, and both these activities are communal ones. In the Junior School an average class of nine-year-old children can learn without difficulty to write simple percussion scores to known tunes, and it is a great encouragement to the class for the best of these to be selected, copied, and played. Once the elements of recorder-playing have been mastered, the children can be encouraged to make up little tunes of their own when practising at home, and to try to write these down.

Experiments have shown that even a "B" class in a "streamed" school soon learns to write simple rhythmic phrases of two or four bars, in duple or triple time, tapped or sung by the teacher, and enjoys doing so. By easy stages the class may be helped to analyse suitable known tunes, and to write them for triangle or drum, section by section. The next stage is that of helping the children to analyse such tunes by singing them to themselves. Thus training proceeds, in this as in all areas of school experience, not simply by providing interesting activities, but by providing experiences which, interesting at the time, constitute progressive learning and may develop lasting interests.

Finally, in relation to these associated fields of school

experience, is the problem of developing in the children an appreciative judgment, a discriminating taste. Unfortunately there is considerable evidence that schools in general cannot claim to have achieved any very marked success in this aim. There are, of course, difficulties. There are no generally accepted objective criteria of artistic "goodness"; even critics disagree as to the goodness of certain works of art; what a teacher may like, another may dislike, and personal preferences obviously cannot be imposed on others as standards of judgment; nor can one say with reason to a class: "You ought to like this."

In discussing this problem it is first necessary to expose the fallacy in the famous and persistent argument developed by Jeremy Bentham. Briefly, the argument is that, as the only purpose of art is to give pleasure, the work of art that gives the greatest pleasure, or pleasure to the greatest number, is the best work of art, for it is the most successful in its only purpose. By this argument, popularity is the only standard of judgment of artistic "goodness". The error lies not in the assumption that the function of art is to please, but in the assumption that the artist's purpose is to please the greatest possible number of people. Usually his aim is to satisfy himself, and in doing so to give pleasure to those of a similarly developed discriminating judgment. One's likes and dislikes, one's "tastes", are capable of modification through relevant experience. One tires of "the cadences which please the common ear", of outworn clichés, one learns to appreciate good craftsmanship, to recognize the sincere, to be irritated by the slipshod, the shoddy, the vulgarly ostentatious, the crude, the ill-designed, the sentimental.

Implied in this conception is the essential principle that the development of a more discriminating taste consists in the modification of one's preferences. Consequently, the

process of training consists in providing the class with relevant and pleasure-giving experiences, so that the interest will gradually become more sensitive, more critical. This kind of training transcends its immediate purpose, that of developing an appreciative interest in the arts, for the qualities one learns to reject are not peculiar to the arts. It is an important psychological factor in this kind of environmental conditioning that, while one's preferences are often spontaneous and unconnected with any known reason, one can usually say why something is *disliked*. As was stated earlier in the chapter, this process of training does not consist in telling a class what it ought to like, but in training it to observe and reject the unworthy. It is in creative work, because of its characteristic absorption of the interest, and because of the hope of achievement that it inspires, that the best opportunity is given to the teacher to help the child to look critically at its own efforts and to discover the satisfaction of doing "good work".

CHAPTER XV

DISCIPLINE

IN the space available for the discussion of classroom discipline, it is possible to refer only to the more important aspects of this controversial topic. First it is instructive to recall that a disciple is a learner and that a discipline is a branch of learning, the bringing of items of knowledge into an orderly related system. Discipline has come to mean the imposition of a similarly controlled orderliness on oneself or on others. Education is itself a discipline in that it implies the development of orderly and controlled living and the maintenance of the conditions under which an orderly and controlled life is possible. In the classroom, therefore, discipline has a twofold significance. First, it implies the maintenance, either by the teacher or by the class itself, of that degree of orderliness under which educational progress may proceed unhampered. Secondly, it involves the training of the members of the class in self-discipline and self-control.

If a society is to function as such, its members have to accept such rules and principles of conduct as the society may deem necessary; they have to recognize certain moral values, and to learn when necessary to subordinate their own desires in consideration for others. Discipline, considered in this way as a form of social and moral training, is not merely "keeping order"; it is, rather, a training in orderliness. It is obvious that such training cannot be achieved either by reducing a class to a sterile condition of abject obedience or by the toleration of the anarchic chaos of unrestrained selfishness in the name of freedom.

The problem of classroom discipline in general is that of the class-teacher relationship, and this in turn depends on the kind of assumptions the teacher makes about the normal response of children to the classroom situation. At one extreme is the group of assumptions that children in general are certain to resist the classroom situation, that they do not want to learn, that they are necessarily opposed to the teacher, and inferentially that compulsion, punishments, the exploitation of fear, or rewards or other incentives, are necessary in order to induce the unwilling children to work. Yet it is commonly observable that young children are anxious to learn, that they are curious about and interested in almost everything they see or hear. Outside school they do not seem to lose this general and instinctive quality, and most children of all ages seem capable of developing interests which they often pursue with great zeal, patience, and energy. The assumption that, when they attend the institution specially designed to help them to learn and to develop interests, they should resist the process may have been intelligible a hundred years ago. But thousands of teachers now know that there is no such necessary resistance in general to school life, that the class-teacher relationship can be a co-operative and sympathetic one, and that the stimulation and maintenance of new interests can and do form part of normal classroom technique in many schools.

It is, of course, impossible to interest all children equally in all things, to provide equally at all times for the individual differences in capacity, energy, and relevant knowledge and experience of the members of a class, or to eliminate the duller aspects involved at some time or other in most learning processes. Nor is it desirable that one should. The cricketer has to work at the nets, the pianist at exercises and studies, and learning to read and to write includes some less interesting and repetitive processes. But it is not *work*

that children dislike, nor is it orderly regulation, but boredom. Most children soon learn to accept routine exercises without question, or can be encouraged to do so, particularly if their purpose and value, in relation to some desired end, are explained and understood. It is when such necessary work is unduly prolonged or is unvaried that boredom introduces resistances to the continuation of the effort.

At the other extreme is the assumption that any imposition of control or task by the teacher is an infringement of the children's freedom, a form of dictatorial repression which the teacher has no right to exert and which the child has every reason to resent. This reaction to the old form of classroom tyranny is, in its extreme form, no more conducive to individual freedom than is the individualistic law of the jungle. It denies by implication the value of social training and, paradoxically, denies the necessary social restrictions on which freedom depends; for freedom can exist only in a social framework, which gives adequate security to the individual willing to co-operate. True discipline, then, can emerge neither from a fear-induced and deadening compulsion, nor from a disorderly confusion of independent wills.

The ideal class-teacher relationship cannot be created in a day, for it is as much the result of training and consistent experiences as is any form of learning. Let us consider, therefore, what is probably a teacher's most difficult disciplinary experience, that of being confronted for the first time by a grown-up class which has just moved up after a year's subjection to an overstrict, unsympathetic and unjust teacher, or from the demoralizing influence of a weak and inconsistent one, or from a year of almost unbroken boredom. Such a class is likely to feel an excited reaction to a year's excessive repression, or to have developed habits of noisy disorderliness, and to have no conception of the pleasure of

orderly, progressive, and interesting work under the guidance of a sympathetic teacher, who, without anger or emotion, tolerates neither discourtesy, confusion, bullying, nor any such behaviour.

The experienced teacher knows how to deal with such a situation, but will, perhaps, permit the writer to leave psychology for a moment and to offer a few suggestions to the young teacher or practising student faced by such a class.

(1) Know exactly what you intend to do with the class; do it immediately, quietly, without fuss, and with all necessary equipment already prepared.

(2) Let it be something new if possible, not too difficult, and something that will keep the whole class occupied.

(3) Let it be something which interests but does not excite the class.

(4) When talking to the class, stop immediately a child ceases to listen or interrupts, and insist on recapturing his attention. Always speak in a reasonably quiet and natural voice, and not for long at a time.

(5) Have the classroom tidy, clean, and as bright and attractive as possible. Refer to this, and to how much more pleasant it is to work in a room in this condition. Mention also that the class is expected to help to keep it in this condition. This suggestion is included as an illustration of the idea that classroom traditions of various kinds can help not only to establish and maintain discipline, but to train the class in self-discipline. An appreciation of simple moral values, the development of habits of courtesy and "good manners", a dislike of slovenliness, and many similar desirable ends can be more easily attained if they are practised as classroom traditions, because this helps each child to recognize his personal responsibility to the class.

To return to psychology in order to understand the factors involved in self-control, we have first to examine the nature

of emotional behaviour. One characteristic of emotional behaviour is that it is accompanied by physical changes. We speak, for example, of "trembling with emotion", of being "pale with fright", or of "blushing from shame". A second characteristic is that, as an emotional state increases in intensity, so behaviour becomes correspondingly less controlled. This is expressed in such phrases as "he was so angry he didn't know what he was doing"; or "he was so excited he lost control of himself". In such a condition physical changes in the body seem to take charge of behaviour instead of reason. A third characteristic of emotion is that each emotional condition, unchecked, can grow from a little beginning to an uncontrollable intensity, as a sense of fear may develop into terror and hysteria, resentment into violent anger, or pleasure into a wild excitement which may induce foolish, passionate, or other forms of regrettable behaviour.

It follows from these characteristics of emotional behaviour that those forms of it which are socially undesirable, such as anger, fear, or excited self-indulgence, should be checked both before they become uncontrollable and before they become habitual; for it is true of emotional behaviour, as of all human behaviour, that each occurrence of it facilitates its recurrence. Even the emotional condition which is a quality of much that is desirable, as joy in successful accomplishment, or delight in aesthetic or other forms of satisfying experience which should be encouraged, have to be controlled before they reach, in less stable children, the stage of uncontrollable excitement.

Much of the controversy concerning child-training is due to the failure to distinguish between desirable training in self-control and undue repression. Self-control obviously involves some repression, but the distinction becomes clear if we consider the difference in meaning between describing someone as "self-controlled" and describing someone as

"repressed". A self-controlled person is one who is not so excitable as to permit emotion to take charge, who can select one of alternative courses of behaviour, who is in charge of his own conduct. A repressed person is one whose actions, rational and desirable though they may be, are checked by habitual fear. Because the undue repression of normal impulses, particularly by the deadening exploitation of fear through threats and punishments, may be harmful, it is absurd to assume that the repression of every kind of impulse is harmful. A "spoilt child", a self-indulgent child untrained in any self-control and consideration for others, is unlikely to be a happy child.

Education, whether that of the school or of society in general, involves a considerable modification of natural impulses; but it is false to assume, as it is often assumed, that in every normal person there is a constant conflict between his natural desires and the restrictions society imposes on them. One learns to approve and even to prefer the conditions imposed by regulated society, many of which soon become habitual. It is natural to eat with one's mouth open, and to use one's fingers. The writer recalls many schools, Infants', Junior, and Secondary, in which the children are happy, busy, courteous, considerate, and fearless, schools in which punishments play no part. Unfortunately, he can also recall schools in which the children's attitude varies from a rebellious resentment against a tyrannical repression and an abject submission to it.

In practice, most of a teacher's disciplinary problems arise from the presence of one or two "difficult" children, who, from a variety of possible but usually discoverable causes, prove troublesome. Since the development of psycho-analysis and kindred doctrines there has been an increased tendency to regard all abnormalities of behaviour as the result of environmental factors, such as home conditions, wrong

early training, or neglect. While it is difficult to distinguish between the effects of very early experiences and hereditary influences, there is no doubt that there are innate individual differences in temperament as in all human characteristics. Of children brought up in the same environment, some are passive, others excitable; some are stubborn, others suggestible; some are self-assertive, others shy. While no one questions the influence of environmental factors and of training, such training is as restricted by the inborn characteristics of a child as is its intellectual development. What can be done, however, has to be attempted, for the sake of the troublesome and troubled child itself, for the well-being of the class and for that of others later, and because the teacher's responsibility to the child and to the class demands it.

It is not sufficient merely to subdue by some process of threat or punishment a troublesome member of a class, or to ignore sulky, passive resistance. Suppression merely hardens a rebellious spirit, and sulkiness, if ignored, can become a more intolerable social nuisance than frank opposition. The object in dealing with non-co-operative members of a class should be to bring them back into the fold by helping them to overcome their innate or acquired difficulties. In so far as it is possible to generalize in respect to the particular problems of individual children, the following suggestions may help the young teacher.

(1) All emotional conditions become increasingly difficult to control as they recur and become habitual, or as they become more intense. It is desirable, therefore, to deal with emotional conditions likely to become troublesome before they do become troublesome.

(2) Trouble is most likely to occur when members of the class lose interest or for any reason cease to be legitimately occupied.

(3) Children do not respect weakness; but they very soon recognize and respect in a teacher that quality which is a blend of firmness, patience, good humour, consistency, and fairness.

(4) There are no circumstances whatever which can excuse loss of self-control in a teacher. A teacher who fails in this respect cannot reasonably expect a class to practise self-control.

(5) If a child persists in being troublesome after having been spoken to, it is usually sufficient to tell the child to wait behind after the lesson, or at play-time, or after school, and then to talk to the offender. What is said depends on the situation, but only in this way is it possible to combine the two functions of classroom discipline, that of maintaining control and that of training in self-control.

In order to help the young teacher or student, or the teacher who experiences disciplinary trouble, the writer has attempted to discuss the subject of classroom discipline objectively and analytically. But the reader is reminded that any such trouble or difficulty is likely to arise only in a classroom in which a teacher has failed or is failing to stimulate, either in the class or in any member or members of it, the right kind of *feeling*, the feeling which comes from an awareness of a sympathetic understanding between child and teacher, which expresses itself in warm-hearted co-operation, and which has the quality of discipleship.

CHAPTER XVI

IN CONCLUSION

MUCH of this book has been given to the problem of keeping alive the interest of a class of children in the various forms of learning which constitute the day-to-day experiences of the classroom. It is at least equally as important that a teacher should maintain and occasionally re-stimulate his or her own interest in the work of the classroom, and it is much more difficult for the teacher to do this than it is for a child. The annual imposition of a syllabus and timetable, possibly unchanged for years, the thought of starting it all over again, in the same classroom, and probably with the same tired-looking classbooks, combine to deaden the early enthusiasm of many young teachers and to turn the teaching process into a mechanized routine.

While a reasonably consistent and planned framework of progressive classroom experience is as necessary for the teacher as it is for the class, it is just as necessary for the conservation of the teacher's interest as it is for the child's that this consistency shall not harden into a rigid, inelastic routine. The principle of a varied uniformity as an essential factor in the attraction and maintenance of interest applies to the teacher just as it does to the child. The most practical and useful way of applying this principle is for the teacher to develop an interest in the *process* of teaching, by trying new ideas, by having the courage to experiment, by keeping up to date with current views and relevant published articles and researches. Interest dies without constant re-stimulation, and the changing conceptions of the aims, content, and

processes of school education provide ample opportunities for the imaginative teacher to keep his interest alive.

Many teachers would improve their teaching and increase their interest in it if they continued to study some of the "subjects" they have to teach. No relevant knowledge is wasted even in the teaching of very young children, and there is no worse teacher than the one who considers it sufficient to be "a chapter ahead of the class". It would be absurd to pretend that the average teacher begins his teaching career with an adequate, general, all-round knowledge of all the subjects for which the non-specialist is necessarily responsible in the classroom. Nor does the coalescing of many areas of classroom activities, the substitution of centres of interest, and the attempt to destroy the old compartmental isolation of "subjects", counteract the inadequacy of relevant knowledge. These tendencies make more rather than less demands on a teacher's knowledge. Some teachers have a special interest in some worth-while pursuit, some hobby or branch of learning or art at which they have become expert. Frequently such teachers successfully introduce some aspect of this into their general teaching, inspiring it with their own enthusiasm. To be interesting, one must oneself be interested.

Probably the most important way in which a teacher may maintain his interest and retain or increase his efficiency is by having a conscious and articulate aim in which he sincerely believes, which he is not afraid to modify as his experience grows, which he is prepared to defend, and which he can use as a standard for the judgment of his own work.

SUGGESTIONS FOR FURTHER READING

Any short selection from the very extensive field of relevant literature must omit many important works and some which many will consider ought to have been included in any such selection, however short. The writer has tried to include at least one book on each aspect of educational psychology to which reference is made in the text, and to choose those which he considers to be of most practical use to the teacher.

A. PERIODICALS

The British Journal of Educational Psychology. Methuen
This journal, issued three times yearly, will help teachers to keep abreast of recent research.

The New Era. N.E.F.

This gives teachers' views on modern techniques of teaching and on teachers' problems. Both journals include authoritative reviews of recent books on education.

B. HANDBOOKS OF THE MINISTRY OF EDUCATION. H.M.S.O.

The following are specially recommended:

School and Life, Making Citizens, The Primary School (particularly the appendix), *Handbook of Suggestions, The New Secondary Education.*

C. BOOKS ON GENERAL PSYCHOLOGY

R. S. WOODWORTH. *Contemporary Schools of Psychology*. Methuen

Each of the following major works approaches the study of human behaviour from a rather specialised standpoint, but each makes a valuable contribution to our knowledge of ourselves.

W. McDOUGAL. *The Outline of Psychology*. Methuen
Here the emphasis is on the motives of human conduct. Though many contemporary psychologists do not accept all the views expressed, the work is an excellent introduction to the study of psychology.

C. SPEARMAN. *The Nature of Intelligence and Principles of Cognition*. Macmillan

Professor Spearman's work has had a great influence on our ideas about knowing and learning, on intelligence assessment, and on statistical psychology.

In the writer's view it tends to oversimplify the cognitive processes, and to over-emphasize the apprehension of relations between items perceived and to give too little significance to the apprehension of items in relationship.

K. KOFFKA. *Principles of Gestalt Psychology*. Harcourt, Brace, New York

See also the writer's article on "Gestalt Psychology" in the new edition of *Grove's Dictionary of Music and Musicians* (Macmillan).

J. B. S. WATSON. *Behaviourism*. Routledge

This is a mechanistic conception of human behaviour, but valuable to the teacher in its emphasis on the extent to which human actions are dependent on mechanized processes.

See also *The Physical Basis of Mind*, a series of broadcast talks, edited by Peter Laslett, and published by the O.U.P.

W. HOLLITSCHER. *Freud, an Introduction*. Routledge
So much of the work of Freud and his successors is commonly misunderstood and misapplied that a teacher, interested in the emotional aspects of child-development and in the concept of the "Unconscious" would, after reading the above work, find it profitable to read some of the works of Freud, Jung, and Adler.

J. BLACKBURN. *Individual Development in Society*. Routledge

D. THE PSYCHOLOGY OF THE YOUNG

C. W. VALENTINE. *The Psychology of Early Childhood*. Methuen

S. ISAACS. *The Children We Teach*. University of London Press Ltd.

C. BÜHLER. *From Birth to Maturity*. Routledge

S. ISAACS. *The Intellectual Growth of Young Children*. Routledge

C. M. FLEMING. *The Adolescent*. Routledge

O. A. WHEELER. *The Adventure of Youth*. University of London Press Ltd.

W. E. BLATZ. *Understanding the Young Child*. University of London Press Ltd.

Z. BENJAMIN. *The Emotional Problems of Childhood*. University of London Press Ltd.

Z. BENJAMIN. *The Young Child and His Parents*. University of London Press Ltd.

This book will be found as helpful to teachers as to parents. The chapters especially useful to teachers are those on "The Importance of Habit", "The Child in His Relations to Others", and "Constructive Discipline".

E. GENERAL BOOKS ON EDUCATION AND EDUCATIONAL PSYCHOLOGY

C. W. VALENTINE. *Psychology and its Bearing on Education*. Methuen

SIR PERCY NUNN. *Education: its Data and First Principles*. Arnold

J. S. ROSS. *Groundwork of Educational Theory*. Harrap

A. PINSENT. *The Principles of Teaching Method*. Harrap

A. W. PANTON. *Modern Teaching Practice and Technique*. Longmans

O. A. WHEELER. *Creative Education and the Future*. University of London Press Ltd.

SIR RICHARD LIVINGSTONE. *The Future in Education*. Cambridge University Press

C. W. VALENTINE. *Introduction to Experimental Psychology*. University Tutorial Press

This book includes extensive references to published researches on Imagery, Learning by Wholes or Parts, and on the general processes of learning and remembering.

F. *PARTICULAR ASPECTS OF EDUCATIONAL PSYCHOLOGY AND PRACTICE*

R. MOCK. *Principles of Art Teaching*. University of London Press Ltd.

This inspiring book is recommended to all teachers.

H. READ. *Education through Art*. Faber and Faber

W. VIOLA. *Child Art*. University of London Press Ltd.

J. MAINWARING. *The Teaching of Music in Schools*. Paxton

J. PIAGET. *The Child's Conception of Number*. Routledge

J. PIAGET. *Logic and Psychology*. Manchester University Press

A short series of most valuable lectures.

R. THOULESS. *Straight and Crooked Thinking*. English Universities Press

F. J. SCHONELL. *The Diagnosis of Individual Difficulties in Arithmetic*. Oliver & Boyd

F. J. SCHONELL. *The Psychology and Teaching of Reading*. Oliver & Boyd

CHESHIRE EDUCATION COMMITTEE. *The Education of Dull Children at the Primary Stage*. University of London Press Ltd.

A comprehensive and essentially practical book.

E. A. TAYLOR. *Experiments with a Backward Class*. Methuen

F. J. SCHONELL. *Backwardness in the Basis Subjects*. Oliver & Boyd

C. W. VALENTINE. *The Difficult Child*. Methuen

C. W. VALENTINE. *The Formal Child*. Penguin Books

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Psychology in the Classroom

This book by Dr. Mainwaring is a practical handbook on the application of psychology to teaching for both the student and the experienced teacher.

He begins by examining the senses through which events and conditions are perceived and discusses how these senses can be used to attract and maintain the interest of the pupil. Mere maintenance of interest, however, is of little use without the process of learning. Dr. Mainwaring discusses the various approaches to the process and the related subject of "forgetting".

In later chapters the author deals with thought, speech, and imagination and how they can be ordered in the best interests of both teacher and pupil. Finally, in his chapter on discipline, Dr. Mainwaring gives practical suggestions to the inexperienced teacher faced with a difficult class.

The book has resulted from Dr. Mainwaring's many years' experience as a teacher and as a Training College lecturer in Education and Psychology. Teachers and student teachers will benefit from reading *Psychology in the Classroom*.

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